

Appendix A

Glossary

APPENDIX A GLOSSARY

Comprehensive plan: those comprehensive plans referenced in Section 10(a)(2)(A) of the Federal Power Act, as defined by FERC regulations (18 CFR 2.19).

Cumulative impacts: the effect on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time.

Enhancement: the act of increasing the value or effectiveness of a resource beyond the level that exists at the time of the application.

Federal lands: means any lands to which the United States holds fee title.

Indian tribe: in reference to a proposal to apply for a license or exemption for a hydropower project, an Indian tribe which is recognized by treaty with the United States, by federal statute, or by the U.S. Department of the Interior in its periodic listing of tribal governments in the Federal Register in accordance with 25 CFR 83.6(b), and whose legal rights as a tribe may be affected by the development and operation of the hydropower project proposed (as where the operation of the proposed project could interfere with the management and harvest of anadromous fish or where the project works would be located within the tribe's reservation).

Mitigation: the act of making a potential impact from a major modification, new project, or nonpower project less severe. Mitigation includes but is not limited to: avoiding the impact altogether by not taking a certain action or parts of an action; minimizing impacts by limiting the degree or magnitude of the action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and compensating for the impact by replacing or providing substitute resources or environments.

Non-Federal lands: for the purposes of provisions governing application for exemption of a small conduit hydroelectric facility, means any lands except lands to which the United States holds fee title. for the purposes of provisions governing application for exemption of a small hydroelectric power project, mean any lands other than federal lands defined in paragraph (b)(8) of the Commission's regulations.

Section 106: Refers to Section 106 of the National Historic Preservation Act

Appendix B

Resource Issues, Concerns, Comments

APPENDIX B RESOURCE ISSUES, CONCERNS, AND COMMENTS

This appendix provides a historical record of preliminary resource issues, concerns, and comments that have been identified by Participants through an open process. Some of these issues were identified during pre-scoping activities conducted between June and November 2000. Others have been developed by the Plenary Group and Work Groups during more recent meetings (December, 2000 and January through July, 2001) or included in comment letters submitted by several of the participants. These comments were used to develop the issue statements in Section 4.0 of this document. Each of these issues may not necessarily result in a study or PM&E measure. Sorting issues will be accomplished through the ALP process and is described in Section 4.0 of this document.

WATER QUALITY AND WATER QUANTITY ISSUES

	EXPANDED LIST		CONSOLIDATED ISSUES LIST
WE1	Look at project effects on all designated beneficial uses of the waterway	W1	Effects of existing and future project operations and facilities on all designated beneficial uses of the water. The beneficial uses for the Feather River watershed as defined in the Basin Plan include municipal and domestic supply, agriculture, electrical power production, contact recreation, warm-water and cold-water fish spawning, rearing and migration, freshwater habitat, and wildlife habitat.
WE2	Water quality objectives, including levels for bacteria, chemical constituents, dissolved oxygen, pH, oil and grease, pesticides, sediment, temperature, toxicity, and turbidity will be evaluated for compliance with the Basin Plan standards	W2	Effects of existing and future project operations on compliance with water quality objectives identified in the Regional Water Quality Control Board (RWQCB) Basin Plan. Specific compliance issues include bacteria, chemical constituents, dissolved oxygen, pH, oil and grease, pesticides, sediment, temperature, toxicity, and turbidity.
WE3	General concerns include all parameters of water quality as flow enters the project boundaries, passes through facility features, and discharges downstream. Direct and indirect effects of the project on aquatic ecosystem health, on recreational opportunity, and on domestic and agricultural supply will be considered	W3	Effects of existing and future project operations on the physical, chemical and biological components of water quality of the Feather River, affected tributaries and downstream waters. The project has the potential for direct and indirect effects on aquatic ecosystem health, on recreational opportunity, and on domestic and agricultural water supply.

WE4	Specific issues will need to be addressed for the issuance of 401 Certification and for disclosure in the Applicant Prepared Environmental Assessment		See W2
WE5	Proximity of project features and recreational facilities to shoreline and banks of water bodies offers potential for introduction of nutrients and bacterial contaminants to these waters. What are the water quality trends (including, but not limited to, nitrogen, phosphorous and coliform bacteria levels) associated with project related activities	W4	Effects existing and future project operations and facilities and its associated recreational facilities, activities and uses on water quality. Proximity of project features and recreational facilities to shorelines and banks of water bodies offers potential for introduction of nutrients and bacterial contaminants to these waters.
WE6	Fuel use at marinas – Floating gas tanks and sewer tanks	W5	Effects of existing and future water-based recreation on water quality of project waters. Concerns include MTBE, oils and greases, fuel spills, floating gas tanks, floating septic systems, floating restrooms, houseboat gray water tanks and pump out facilities.
WE7	Lake Oroville, fed by tributaries that have a history of gold mining activity, has potential for accumulation of elemental mercury in its basin sediments. Potential presence and uptake of methylmercury through the food chain must be assessed	W6	Effect of existing and future project facilities and operations on sediment deposition and potential impoundment of metals and toxins, including the potential presence and uptake of methylmercury through the food chain. Lake Oroville, fed by tributaries that have a history of gold mining activity, has potential for accumulation of elemental mercury in its basin sediments.
WE8	Provide protection of riparian areas and water quality by limiting disturbance in streamside management zones according to ground slope and stability, stream class, channel stability, fishery, and other beneficial uses, and favor riparian-dependent resources in cases of competing resource demands	W7	Effect of existing and future project-related land management and watershed management activities (including waste disposal and pesticide use) on water quality, slope stability, erosion, sedimentation, channel stability, riparian habitat, fish habitat, and other beneficial uses. See GE18
WE9	Encourage natural protective processes.	W18	Effect of existing and future project facilities and operations on natural protective processes (e.g., marshes).

WE10	Maintain or improve water quality to protect beneficial uses and meet or exceed State objectives.		See W1, W2, W3
WE11	Avoid water quality degradation by using Best Management Practices during land management activities, and reduce sedimentation and channel erosion by rehabilitating deteriorating watersheds		See W7, G3, GE13, GE15, GE17
WE12	Coordinate with counties, Cal-Trans, and the Union Pacific Railroad to eliminate the sidecasting of waste material along travel ways, except at designated locations		See W7, G3
WE13	Reduce sediment yields from watersheds in deteriorating conditions and those tributary to eroding channels or hazardous flood prone areas		See W6, W7, GE15, GE17
WE14	Do analysis and mitigation on a watershed basis		See W7, GE13
WE15	Cooperate with local, State, and Federal agencies as well as private landowners in long-range watershed planning. Use an interdisciplinary approach.		See W7, G3, GE14
WE16	Depth and capacity of the Oroville reservoir creates a thermally stratified condition. What is the cold-water pool retained in the basin and what is its availability for release in various water year types	W9	Effects of existing and future project facilities and operations on thermal stratification and other thermal processes on project waters, including availability of cold water for release in various water year types under current and future operational demands.
WE17	Water temperatures are an issue of concern for both aquatic resources and agricultural interests. Temperature monitoring is ongoing, and plans are to examine how specific water releases and operations will affect temperatures in the river, Afterbay, and hatchery	W10	Effects of existing and future water releases and operations on water temperatures in the Diversion Pool, Forebay, Afterbay, Oroville Wildlife Area, low-flow section of the river and downstream areas; at the hatchery; for agriculture; and the quality and availability of habitat for salmonids and other aquatic resources.

WE18	Are the existing temperature requirements defined under the State Water Projects Feather River Flow Constraints being met and are they adequately protecting steelhead and fall, late-fall, and spring-run chinook salmon in the low-flow section and in the river downstream of Thermalito Afterbay outlet	W11	Existing and future project compliance with temperature requirements of the SWP Feather River Flow Constraints and effectiveness of constraints for a) protection of salmonids in the low-flow and high-flow sections of the Feather River; and b) hatchery operation
WE19	Is the availability of a cold-water pool in Lake Oroville adequate under present and future operational demands to meet the existing downstream cold fresh-water habitat requirements of steelhead and fall, late-fall, and spring-run chinook salmon		See W1, W9, W10, W12, F1
WE20	Are the existing temperature requirements defined under the State Water Projects Feather River Flow Constraints adequate for the operation of the Feather River Hatchery		See W11, F11
WE21	Is the availability of a cold-water pool in Lake Oroville adequate under present and future operational demands to meet the cold-water requirements defined under the State Water Projects Feather River Flow Constraints for the Feather River Hatchery		See W11
WE22	Does the existing Temperature Control Device (TCD) in Lake Oroville provide adequate access to the cold-water pool during below normal water or drier years	W12	Effects of existing and future project facilities and operations on access to the cold-water pool during below normal (BN) water years and multiple BN water years under existing and future operational demands, and effectiveness of the Temperature Control Device in providing access.
WE23	Will the existing TCD in Lake Oroville provide adequate access to the cold-water pool under future operational demands particularly during a series of dry and critically dry years		See W12
WE24	Warm water release requirements for agricultural production		See W1, W3

WE25	Does the present temperature model have the ability to forecast average daily water temperatures, under present and future operational demands, in the low-flow channel and in the river from the Thermalito Afterbay outlet down to Verona		See W 1, W2, W3, W9, W10, W11, W14
WE26	How does the Feather River Hatchery requirement for warmer water in the summer impact river water temperatures required for holding or rearing of steelhead and spring-run chinook salmon in the low-flow section? That is, should the hatchery water come directly from Lake Oroville rather than from the river at the Fish Barrier Dam in order that both hatchery and river temperature needs can be satisfied	W13	Effects of existing and future hatchery operations on water quality and water temperatures in the Feather River and Afterbay.
WE27	How does the pump-back operation during the summer months affect water temperatures required for holding and rearing of steelhead and spring-run chinook salmon in the low-flow section and in the river downstream of Thermalito Afterbay	W14	Effects of existing and future pump-back operations on water quality and water temperatures (in Lake Oroville, Diversion Pool, Forebay, Afterbay, and Oroville Wildlife Area), habitat suitability, and outmigration for salmonids.
WE28	Does the increase in river water temperature that results from warmer Thermalito Afterbay releases during the spring, summer, and fall months limit the amount of suitable steelhead and salmon habitat in the river downstream of Thermalito Afterbay		See W10, F10
WE29	Does the increase in river water temperature that results from warmer Thermalito Afterbay releases during the spring and early summer months affect survival of salmonid species outmigrating from the Feather and Yuba River		See W10, F10
WE30	Are dissolved oxygen levels in the Feather River from Thermalito Afterbay to Live Oak a problem during the spring, summer, and fall months		See W1, W2, W 3, F1
WE31	How have turbidity levels been affected by project operation		See W1, W2, W3

WE32	Thermalito Afterbay acts as a thermal retention basin for project water prior to delivery to water districts outside the project boundary. How do releases from this water body affect the stream temperature and dissolved oxygen content of Feather River receiving waters.		See W1, W2, W3, W9, W10, F1
WE33	Relationship between hatchery and water quality		See W3, W13, F9
WE34	Effect on water quality of livestock grazing		See W7
WE35	Water contamination at North Forebay related to swimming opportunities		See W4, W5
WE36	Both cold-water and warm-water habitat, spawning, and migration uses have been designated for surface waters potentially affected by the project. A determination must be made as to the specific thermal habitat that may be reasonably provided in each water body within project boundaries and downstream of the project		See W1, W2, F1
WE37	Dredging of lower river to make suitable fish habitat		See W1
WE38	Floating septic tanks		See W5
WE39	Effects of boating on MTBE		See W5
WE40	Minimum level of draw-down effect on water temps		See W1, W2, W3, W10
WE41	What coordination for Page 2 #5? -- Could be items along roads that might sweep into the river during floods.		See W6, W7
WE42	Floating restrooms, houseboat gray water tanks and pump out facilities effects on water quality		See W5
WE43	Sewage spills into Lake Oroville		See W4, W5
WE44	Fuel spills as a result of fluctuating lake levels		See W4, W5

WE45	Effect on water quality from boat maintenance and cleaning products -- "biodegradable"		See W4, W5
WE46	Spawning habitat in tributaries as they relate to operations		See W1, W3, W7, W10, W11, F3
WE47	Effects of lake level changes on cultural resources due to water quality contaminants		See W1, CR2, CR3
WE48	Macroinvertebrates as an indicator of water quality		See W1, W2, W3, FE36
WE49	Project effects, by water type year and season, on natural hydrology, and restoration of a more natural hydrograph		See W8, GE20, GE23
WE50	Conversion from lotic to lentic environment and accompanying changes in water quality		See W1, W2, W3, W8,
WE51	Potential risk of non-project-related toxic spills and effects of toxic spills on project waters	W15	Potential for non-project-related toxic spills (e.g., from railroad operations) and effects of toxic spills on project waters
WE52	Cumulative effects of project operations and other past, present and reasonably foreseeable actions on water quality.	W16	Cumulative effects of existing and reasonably foreseeable future project operations on water quality.
WE53	Consider water quality downstream of Oroville facilities and the effect of low flows on dilution of contaminants entering the Feather River downstream		See W2, W3
WE54	Impact of project structures and operations on water quality conditions necessary to sustain anadromous salmonids and their habitat. Adequacy of current project operating regimes and structures to optimize water quality conditions for anadromous salmonids and their habitats.		See W1, W3, W10, W11, W14, F10
WE54	Effects of reservoirs and Feather River downstream of Oroville Dam on groundwater quality and quantity (e.g. hyporheic zone interaction).		See W17

FISHERIES ISSUES

EXPANDED LIST (original item numbers)		CONDENSED LIST (new item numbers)	
FE1	Are the project related Lake Oroville water level fluctuations presently affecting the reproduction and survival of warm-water sportfish;	F1	Effects of existing and future project operations (including power generation, water storage and releases, ramping rates, pump-back, water levels, and water level fluctuations) during all water year types on the behavior (e.g., migration timing, microhabitat selection, vulnerability to predators), reproduction, survival and habitat of warm- and cold-water fish and other aquatic resources (e.g., macroinvertebrates) in project waters, which include tributaries within the project boundaries (Lake Oroville, Diversion Pool, Fish Barrier Pool, Forebay, Afterbay, Oroville Wildlife Area), and in project affected waters
FE2	How will the project related Lake Oroville water level fluctuations affect the reproduction and survival of warm-water sportfish under future operational demands;		See F1
FE3	Is the present minimum pool adequate for protecting the Lake Oroville cold-water sport fishery;		See F1, W10, W12, W14
FE4	Have biologists describe the extent of viral infection in Lake Oroville;	F2	Effects of existing and future project operations (e.g., pump-back operations, hatchery production, water temperature, etc.), on the establishment, transmission, extent, and control of IHN, BKD, and other significant cold-water and warm-water fish diseases within Lake Oroville, and lower river
FE5	Would a fish screen(s) on the pump-back operation prevent Infectious Hemopoatic Necrosis (IHN) and other diseases specific to Salmonid species from spreading and becoming permanently established in Lake Oroville? IHN, if permanently established in Lake Oroville would affect survival of hatchery and river spawned Salmonid species;		See F2

FE6	Are additional funds needed for law enforcement? Presently 2/3's of all the local game warden activities are spent on the Oroville Wildlife Area. An augmentation of funding for more wardens would free up time for other law enforcement activities outside of the wildlife area;		See LM2, LM4
FE7	Has DWR completed or met all its obligations for recreation mitigation (wildlife habitat and fishing) under the existing FERC license;		See R1
FE8	Lake Oroville releases made for power generation may cause dramatic fluctuations in lake level. What are the potential impacts of fluctuation zone and surface elevation change on recreation opportunities and on fish and wildlife habitat?		See F1, R3, W4, W10
FE9	Use Instream Flow Incremental Methodology (IFIM) or a comparable methodology to determine streamflow needs to ensure that trout habitat quality and quantity are not reduced within project area and/or project affected areas;	F3	Project effects on resident fish species (e.g., trout and other salmonids and warm-water fish) habitat quantity and quality (including instream flow, sediment, woody debris, water temperature, etc), and habitat for other aquatic species (also see G1)
FE10	Provide for fish passage on any drainage or stream where spawning activity occurs;	F4	Project effects on resident fish passage, including North Fork Feather River at Big Bend Dam, tributary streams, and project affected waters
FE11	Inventory streams, streamside areas, and other wetlands in deteriorating condition and restore on a priority basis within project area and/or project affected areas		See W7, G1
FE12	Protect and improve wild trout habitat;		See F3
FE13	Require proponents to coordinate with Plumas National Forest (PNF) in analysis of instream flow need for all potentially affected riparian dependent species;		See F3
FE14	Provide for fish passage and maintain natural channel character at stream crossings within project area and/or project affected areas;		See F4, G1

FE15	Develop and maintain a balanced fishery;		See F5
FE16	Establish and locate area for bass tournaments on the lake and include stands, parking, water, electricity, vendors, boats, etc.;		See R1, W4
FE17	Shooting carp – investigate use at Lake Oroville for this activity;		See R1
FE18	Develop and implement a long-term fisheries management plan;	F5	Effects of existing and proposed fisheries management plan(s) and activities on a balanced cold- and warm-water fishery (including stocking levels, hatchery management and production relative to in-river populations, habitat enhancement projects, predator and undesirable species control and prevention of future introductions (e.g., Northern pike, striped bass, etc.), disease, tree stakes and tire removal, and harvest)
FE19	Rearing bass (plants) for recreational and trophy fishery;		See F5, R6
FE20	Develop bank fishing sites, cutaways used as fish habitat;		See R1, W4
FE21	Remove or replace fish ladder at North Fork Feather River Big Bend Dam so that cold water fish (salmon and trout) are able to spawn in natural waters;		See F4
FE22	Prevent Northern Pike from entering Lake Oroville by eliminating them from the licensee's upstream impoundments. If Northern Pike enter Lake Oroville and Feather River watershed, aggressively address the problem and successfully eliminate the fish;		See F5, F16, T7
FE23	Hire a full-time independent biologist for Lake Oroville in addition to DWR biologist;		See F1, F5

FE24	Evaluate potential to restore Ruddy Creek;	F6	Effects of existing and future project operations on sediment deposition, erosion, and recruitment through the system (including downstream sediment supply) and associated changes in water quality on the quantity and quality of aquatic habitats within project affected waters
FE25	Interaction of lake fishery with tributaries fisheries;	F7	Project effects on interactions, including predation and competition, among lake and tributary fish populations (e.g., land-locked Chinook salmon, trout, bass, and other land-locked species) that affect species abundance, growth, reproduction, and survival
FE26	Traditional fishing activities that were impacted by construction of dam;		See CR2, CR3
FE27	Land-locked salmon fishery;		See F7
FE28	North forebay – preservation of existing wildlife;		See T1
FE29	Protection of upstream resources energy balance issues – historic uses salmon – steelhead moving upstream – biomass – nutrient dispersal;	F8	Project effects on resource energy balance in terms of changes in biomass and nutrient dispersal due to loss of anadromous fish carcasses upstream of Lake Oroville (on fish and wildlife)

FE30	Trophy fishing in North Fork Feather River outside of project boundaries;		See R6
FE31	Several fish hatchery issues need resolution, such as the relationship between the hatchery and restoration of a natural ecosystem, straying and genetic impacts, harvest rates, and disease;	F9	Hatchery effects (e.g., straying, genetic impacts, harvest rates, disease, temperature requirements, interactions with native fish such as predation and competition) on salmonid populations in the Feather River Watershed and other Central Valley tributaries and on ecosystem restoration within project waters and project affected waters.
FE32	Ongoing studies in the lower Feather River include adult and juvenile steelhead snorkel surveys and a habitat inventory, beach seine surveys to determine the temporal and spatial rearing extent of juvenile steelhead	F10	Effect of existing and future project facilities and operations on anadromous fish habitat and populations (e.g., instream flows, water temperature, ramping rates, riparian habitat, large woody debris,

FE32 Cont.	and salmon, rotary screw trap sampling of Chinook salmon to monitor the timing and number of emigrants, Chinook egg survival studies, particularly in the low-flow channel, Chinook spawning escapement surveys, redd de-watering and juvenile surveys in the Lower Reach, effects of water temperatures on juvenile steelhead rearing, steelhead creel surveys to gather adult steelhead life history data, and invertebrate research;		predation, spawning gravels, stranding and desiccation, macroinvertebrate prey base, upstream and downstream passage, rearing conditions)
FE33	Are the present streamflows defined under the State Water Projects Feather River Flow Constraints being met and are they adequately protecting steelhead and fall, late-fall, and spring-run Chinook salmon in the low-flow section and in the river downstream of Thermalito Afterbay for migrating, holding, spawning, and rearing of steelhead and fall, late-fall, and spring-run Chinook salmon;	F11	Compliance of project operations with SWP Feather River Flow Constraints and adequacy of constraints to protect anadromous fish and other aquatic species in the low-flow section and in the river downstream of the Afterbay. See also G1, GE7, W11
FE34	Is additional Physical Habitat Simulations modeling (PHABSIM) necessary to determine what streamflows are necessary for spawning and rearing steelhead and fall, late-fall, and spring-run Chinook salmon in the low-flow section and in the river downstream of Thermalito Afterbay;		See F10
FE35	Is riparian vegetative cover in the low-flow section and in the river downstream of Thermalito Afterbay adequate under present flow conditions for rearing steelhead and fall, late-fall, and spring-run Chinook salmon;		See F10
FE36	Under existing conditions, does the diversity and abundance of benthic macroinvertebrates in the low-flow section and in the river downstream of Thermalito Afterbay suggest a healthy stream channel;		See F10, W1, W3, G1, WE48

FE37	Under existing conditions, are there adequate amounts of suitable gravel for salmonid spawning in the low-flow section and in the river downstream of Thermalito Afterbay;		See F10, G1, GE9, GE10
FE38	Preserve natural riparian flood control abilities. Remove only those log jams or major debris accumulations that have a high potential of causing channel damage, block fish passage, or could be transported downstream by high flows and cause loss of property;		See F10, G1, G2, GE5, GE8
FE39	Insure that stream alterations restore the original flow capacity while preserving the existing channel alignment;		See W7, G1, G2, GE8
FE40	Comply with the Executive Orders 111988, Floodplain Management, and 11990, Protection of Wetlands;		See LU1, T5
FE41	Early on and clearly identify flow rates and temperature requirements downstream of the dam;		See F10, F11, W10, W11
FE42	Work together with DFG to preserve and continue hunting and fishing opportunities in the after-bay and borrow areas;		See R5, R6
FE43	Consider changes in flow rates on recreational fishing;		See R3
FE44	Increase emphasis on steelhead protection and habitat and less on salmon;		See F5, F10, R6
FE45	Evaluate salmon numbers;		See F10
FE46	Clearly identify species, landowners along river, flow rates and temperature requirements downstream of the dam;		See F10, F11, W10, W11
FE47	Desire to see a balanced fishery;		See F5, R6
FE48	Evaluate potential of fish diseases spread from Lake Oroville to Feather River and back as result of pump-back operation;		See F2

FE49	Incidence of fish disease in response to temperature changes below dam;		See F2, W10, W11
FE50	Barbless hooks for steelhead catch/release of females;		See R6
FE51	Impact of local actions on regional fisheries – impact area and what is contained within that area;	F12	Evaluate existing and reasonably foreseeable future project effects in terms of cumulative impacts on regional fisheries, fish passage, and habitat quality and quantity within project-affected areas. Also see G6
FE52	Facility operations and impact – on bass fishery and spawning activities at afterbay (protect and enhance bass fishery);		See F1, F5, F7, W10
FE53	Are the present project related flow ramping/fluctuation restraints adequately protecting rearing Salmonid species from being stranded in the low-flow section and in the river downstream of Thermalito Afterbay;		See F10, F11
FE54	Are the present project related flow ramping/fluctuation restraints adequately protecting Salmonid redds and juveniles, conserving their habitat and forage, and spawning gravel from being scoured out from the low-flow section and from the river downstream of Thermalito Afterbay;		See F10, F11, GE9, GE10
FE55	What engineering or other reasonable and prudent solutions are available that would prevent the interbreeding of fall and spring-run Chinook salmon in the low-flow section of the Feather River (migration barrier and/or flow and temperature changes in low-flow section);		See F10
FE56	The Feather River's low-flow reach has historically provided spawning habitat for a cold-water fishery. How have reduced flows to this stream reach affected water temperature and gravel substrate necessary for successful salmonid reproduction?		See F10, W10, W11, GE10

FE57	Provide habitat leading to viable populations of endangered species. Maintain habitat to support viable populations of all native and desired nonnative vertebrate species;	F13	Project effects on fish species listed for protection under the California and/or federal Endangered Species Acts (ESA), species of special concern, candidate species, proposed, and likely listed threatened and/or endangered fish species, and the habitat needed to support them
FE58	Improve and protect habitat for designated emphasis and harvest species. Identify and evaluate potential conflicts among project effects and management actions for protected and sensitive species;		See F5
FE59	Protect and improve habitat for trout;		See F1, F2, F3, F4, F7
FE60	Species recovery in upper and lower river;		See F13
FE61	Maintain Feather River contribution of 20% of the commercial ocean salmon catch	F14	Effects of existing and future project facilities and operations on the levels of recruitment of Feather River salmonids to the ocean population (e.g., sustained production of 20% of the commercial catch)
FE62	Re-introduction above dam of anadromous fish	F15	Evaluate the quantity and quality of existing upstream habitat conditions and potential sources of mortality for anadromous salmonid spawning, rearing, and juvenile emigration. If upstream habitat conditions and constraints (e.g., disease transmission) are considered to be suitable, evaluate the feasibility of alternative methods for providing passage of anadromous salmonids (e.g., fish ladder, fish elevator, bypass channel, trap-and-truck), upstream of Oroville Dam. Assess conflicts and constraints among species and lifestyles and their habitat, and evaluate, the overall biological benefits to the species and upstream ecosystem (e.g., nutrient transfer)
FE63	Coordination between re-licensing effort and existing management plans in and out of the project boundary		See F5
FE64	Effect of project on available upstream fishery habitat (Incorporate all project facilities)		See F3, F4, W3

FE65	Explore offsite mitigation opportunities		See F5
FE66	Expand land-lock fishery to include all salmon not just Chinook		See F1, F7
FE67	All tributaries to project waters evaluated for spawning potential including upstream of Big Bend diversions		See F4
FE68	Assurances of how things will be done, guarantee credible data, and sustainability of solutions (adaptive management).		F1, F11, F13
FE69	Page 8 Bullet 8 – split into two issues		See F10, F11
FE70	Potential to reopen salmon fishery above Highway 70 bridge		See F5
FE71	Species recovery in reservoir and river		See F13
FE72	ESA compliance, want to hear about conflicts with folks and other species (bald eagles);		See F13
FE73	Responsible management by resource agencies;		See F5
FE74	What are the cumulative project impacts on passage of anadromous and riverine fish;		See F12, G6
FE75	Project structures or operations that either have in the past, or continue to introduce predators, create suitable habitat for predators, harbor predators, or are conducive to the predation of salmonids;	F16	Effects of existing and future project facilities and operations on the abundance of predators, their seasonal and geographic distribution, the impact of predation mortality on population dynamics of salmonids and other species, and alternatives for predator control and management (including prevention of introductions)
FE76	Prevent the introduction of new piscivorous (fish-eating) predators (e.g., northern pike, striped bass, white bass, etc.) introductions to project waters;		See F16
FE77	Predation of fish species naturally occurs under all conditions. However, project conditions could exacerbate the occurrence of predation on certain species. Changes in license conditions could lead to unnecessary increase in predation on desirable		See F16

FE77 Cont.	gamefish or threatened and endangered species, or other species of concern. Occurrence (habitat, distribution and numbers of predator fish should be identified in all riverine waterways affected by project releases. Predation investigations should be comprehensive and predator management be available as a fishery management tool.		
FE78	Quality and extent of habitat above currently impassable barriers to migration;		See F1, F3, F12, F15
FE79	Oroville Reservoir provides substantial recreational fishing opportunity for both black bass and Chinook salmon fisheries. Hatchery planting practices for Chinook salmon could be impacting habitat conditions and the population dynamics of black bass and other species, thus impairing socioeconomic use. Fishing interests want to improve the reservoir fishery so that it becomes a more popular recreational destination as a result of a successful balanced species reservoir fishery. An appropriate balance of species should exist in the reservoir to support environmental sustainability and long-term maintenance of a healthy ecosystem;		See F5, F7, R6, W4
FE80	Big Bend Dam is located on the North Fork Feather near the maximum elevation of Lake Oroville. The dam has been partially breached, but appears to act as an impediment to up- and downstream migration of fish and aquatic dependent species during portions of the year. There is an interest in determining the impact of Big Bend Dam on migration of fish and aquatic dependent species from Lake Oroville to the North Fork Feather River and back;		See F4

FE81	Currently some of the species of fish commonly found in Lake Oroville are also found in the Poe reach of the North Fork Feather River. Maximum water temperatures in the Poe reach often exceed 20 C (68 F), making management of the Poe reach as a coldwater fishery difficult. There is an interest in determining the interaction of the Lake Oroville fishery with the Poe reach fishery, and identifying measures that can be taken to maintain the Poe reach as a coldwater fishery;		See F3, F, F7, W10
FE82	Prior to construction of Oroville Dam anadromous fish had access to the POE reach of the North Fork Feather River. These fish provided a source of energy to the river ecosystem. Construction of the dam severed that connection. There is an interest in determining the contribution of anadromous fish as an energy source for aquatic dependent species located in the North Fork Feather River and devising a strategy for replacing this loss.		See F8, F15
FE83	Macroinvertebrates as an indicator of water quality;		See F1, W1, W3, G1
FE84	Evaluate indicators of hydrological alteration (IHA analysis);		See F1, F3, F10, GE6, GE20
FE85	Impact of project facilities and operations on fish passage includes structures, flows, and/or water quality conditions that impede or block passage within and from current and/or historic habitat and operations that impact passage or have the potential to enhance passage. Passage includes movement of spawning or holding adults, emigrating smolts, or movement of juveniles to different habitat areas for purposes of feeding, avoiding predators, or sheltering;		See F1, F4, F12, F15, W10, W12, W14

FE86	Adequacy of current ramping rate to protect anadromous salmonids and conserve their habitats and forage. This includes providing a range of schedule of flows necessary to optimize habitat, stable flows during spawning and incubation of in gravel forms, flows necessary to ensure redd replacement in viable areas, and flows necessary for channel forming processes, riparian habitat protection and maintenance of forage communities. This also includes impacts of flood control or other project structures or operations that act to displace individuals or their forage or destabilizes, scours, or degrades habitat;		See F1, F10, F13, G1, GE12
FE87	Introgression occurring between various runs of Chinook salmon and between hatchery and wild salmon and steelhead. This includes direct, indirect and cumulative impacts from hatchery practices, project facilities and operations, lack of adequate spawning habitat and impassable migration barriers that exclude access to historic spawning habitats;		See F9
FE88	Impact of hatchery facilities and/or operations on anadromous salmonids. This includes the direct, indirect and cumulative impacts of hatchery product on anadromous salmonids and the direct, indirect and cumulative impacts of hatchery facilities and operations on salmonids and their habitats;		See F9, W13
FE89	Impact of project structures and operations on water quality conditions necessary to sustain anadromous salmonids and their habitats;		See F1, F6, F10, W1, W9, W10, W11, W12, W13, W14
FE90	Adequacy of current project operating regimes and structures to optimize water quality conditions for anadromous salmonids and their habitats;		See F1, F10, F11, W10, W11, W12, W13, W14
FE91	Current condition of habitat potentially impacted by project and alternatives to conserve or enhance anadromous salmonids;		See F1, F5, F10, F12, F13, F14, F15

FE92	Priority of salmonid habitat conservation in current operating criteria and various operating agreements;		See F5
FE93	Introgression occurring between fall-run and spring-run Chinook populations in the Feather River due to hatchery practices and impassable migration barriers;		See F1, F9, F10, F12, F15
FE94	Evaluate the potential impacts of striped bass predation mortality on juvenile Chinook salmon and steelhead within the lower Feather River and the effects of project operations on predator-prey interactions, and identify and evaluate alternative methods for controlling and reducing predation mortality by species such as striped bass on juvenile rearing and emigrating salmonids;		See F16
FE95	The lower Feather River provides habitat to support a variety of anadromous fish species including Chinook salmon, steelhead, striped bass, American shad and sturgeon. Potential changes in license conditions could adversely impact habitat supporting these species. Habitat investigations should evaluate the existing quality and quantity of habitat and determine alternative improvements for the various life history needs of anadromous species including flow, water temperature, instream and riparian cover, substrate and spatial area;		See F1, F3, F5, F6, F9, F10, F12, F13, W10, W12, W13, W14, GE12
FE96	The lower Feather River provides habitat to support a variety of resident native and resident introduced species including coldwater species such as rainbow, brook, and brown trout, and warm water species such as bass, catfish, bluegill, green sunfish, carp and others. Potential changes in license conditions could adversely impact habitat supporting these species or upset habitat conditions such that less desirable species are favored. Habitat investigations should		See F1, F3, F5, F6, F9, F12, W1 W10, W12, W13, W14, GE12

FE96 Cont.	evaluate the existing quality and quantity of habitat and determine alternative improvements for the various life history needs of these resident native and non-native species including flow, water temperature, instream and riparian cover, substrate and spatial area;		
FE97	The habitat for fishes in the lower Feather River is affected by the flow releases from the project. Seasonal timing, volume, and rate of release all have an affect on fish habitat conditions. Potential changes in license conditions for flow releases could adversely affect habitat conditions for one or more fish species. Fishery investigations should examine the adequacy of flows for maintaining all life history needs for anadromous and resident species. There should be evaluation of potential for flow improvements in the low-flow section. Fishery investigations should be sufficient to determine how best to meet the combined needs of the various anadromous and resident fish species;		See F1, F3, F10, F11, F12, F13W1, W8, GE12
FE98	Fish passage is an essential survival element for anadromous species and obstructed passage can also have serious adverse impact on resident species biodiversity and populations. Both upstream and downstream-unobstructed fish passage below the project should occur. Fishery investigations should examine the adequacy of passage for all species in the reaches of the lower Feather River downstream of the project. Evaluations should cover a sufficient range of flows and include examination of instream pits or gravel ponds;		See F10, F12, F15
FE99	The Feather River Hatchery was constructed to mitigate for losses of upstream habitat when the Oroville facilities were constructed. There is a body of evidence suggesting that improperly planned hatchery practices can adversely impact native and non-		See F9, W10, W13

FE99 Cont.	native species including anadromous species. The effects of hatchery practices on naturally reproducing/self-sustaining anadromous populations should be examined as part of the fishery investigations. These evaluations should examine alternative practices that would lead to increased naturally reproducing/self-sustaining anadromous populations. Improper hatchery practices can also lead to transmission of serious fish diseases, and impact overall susceptibility of naturally reproducing populations to diseases.		
FE 100	Create more habitat for the black bass and warm water fishes such as spawning beds or boxes; spawning plates or stationary buoy cables.		See F5, F7

TERRESTRIAL RESOURCE ISSUES

FEBRUARY 12 LIST		CONSOLIDATED ISSUES LIST	
TE1	Efficiently manage recreation in the LOSRA		See R5
TE2	Maintain winter habitat for bandtailed pigeons	T1	Effects of project features, operations (including power generation, water releases, pump-back, water levels and water level fluctuations) and maintenance on wildlife and wildlife habitat. Specific concerns include deer winter range, bandtailed pigeon winter habitat, designated emphasis and harvest species, wintering and nesting waterfowl, and other wildlife use of project and project-affected waters.
TE3	Maintain or enhance deer winter range		See T1
TE4	Provide suitable bald eagle foraging habitat along the North Fork upstream from Lake Oroville	T2	Project effects on federal and state listed, species of concern, candidate, proposed, and likely listed threatened, endangered and sensitive plant and animal species and the habitat needed to support them. Concerns include, but are not limited to, amphibians, bald eagle foraging habitat, winter roosts, and nesting territories

TE5	Use site-specific, integrated pest management approach to control forest pests, employing mechanical, cultural, biological, and/or chemical methods based on effectiveness, cost-efficiency, and protection of human health and environmental quality		USFS identified this as a resource goal, not an issue; delete from list
TE6	Re-vegetate disturbed areas within floodplains to stabilize soil, benefit fish and wildlife, and restore the natural flood control qualities	T3	Effects of existing and future project operations on floodplains and water fluctuation zones, including soil stability, wildlife habitat and natural flood control functions, revegetation and restoration opportunities (e.g., red willow planting)
TE7	From January through August limit activities within active Bald Eagle nesting territories		See T2
TE8	Between November 1 and March 31 limit activities within winter Bald Eagle roost habitat		See T2
TE9	Water releases from Oroville Dam and downstream impacts (vegetation and properties)		See G1, G2, T3, T5
TE10	Continue cooperation allowing the CDPR to manage the reservoir area including Plumas National Forest lands		See T6, LM3, R5
TE11	Encourage species recovery		See T2
TE12	Develop plans for each Bald Eagle nesting territory; perform habitat improvement projects to enhance bald eagle nesting, roosting or foraging habitat		See T2
TE13	Have adequate surveys been completed to determine what State or federally listed species (plant and animal) are potentially being impacted by project operations		See T2
TE14	Map plant and wildlife habitat communities	T4	Existing and future Project effects on biodiversity (including plant species and communities and wildlife) and ecosystem health and stability

TE15	Inventory and monitor State and federal protected and sensitive plant and wildlife species		See T2
TE16	Provide habitat leading to viable populations of endangered species		See T2
TE17	Maintain habitat to support viable populations of all native and desired nonnative vertebrate species		See T1, T2, T4
TE18	Improve and protect habitat for designated emphasis and harvest species		See T1, T4
TE19	Provide diversity of plant and animal communities and tree species by assuring the continuous and viable presence of all seral stages of all native plant communities on the forest		See T1, T2, T4
TE20	Provide a diversity of vegetation types and habitat to support viable populations of all fish, wildlife, and plant species		See T1, T2, T4
TE21	Maintain and enhance the suitability of currently occupied nest territories, and provide sufficient potential nesting, foraging and winter habitat to meet recovery goals of the Pacific States Bald Eagle Recovery Plan		See T2
TE22	At a minimum, provide habitat sufficient to maintain existing Bald Eagle populations		See T2
TE23	Minimize adverse impacts to riparian resources through appropriate mitigation	T5	Existing and future Project effects on riparian resources and protection and management of riparian habitat and wetlands (including vernal pools and brood ponds)
TE24	Facilitate hydroelectric development that provides protection of riparian resources		See T5
TE25	Maintain viable populations of sensitive plant species. Protect sensitive and special interest plant species, as needed, to maintain viability.		See T2, T4

TE26	Are additional funds needed to augment the existing budget of the Oroville Wildlife Area? Presently available Fish and Game funds are being dedicated to managing people and not wildlife habitat	T6	Interagency management coordination; adequacy of management plans and activities and funding for wildlife management
TE27	Various recreational and public use facilities were designated as mitigation measures to minimize impacts resulting from the original Oroville Project construction. The licensee should provide a complete inventory of recreational mitigation obligations required by Articles of the existing FERC License, and should clearly disclose the current status of compliance with those measures		See R1
TE28	Manage the Wild and Scenic Zones of the Middle Fork of the Feather River consistent with the Wild and Scenic Rivers Act		See R5
TE29	Interaction of lake with wildlife species (birds, amphibians, etc.) – how is lake used		See T1, T3
TE30 a	Inventory and map alien plant and animal species	T8	Effects of the project on the introduction, distribution and management of undesirable, non-native wildlife species See T7
TE30 b	There is an interest in determining locations of noxious weeds within and adjacent to the project area and determining control and eradication measures as needed. Inventory plants located on National Forest system lands within and adjacent to project facilities as well as the perimeter of Lake Oroville. Survey for California Department of Food and Agriculture Category A, B and C noxious weeds	T7	Effects of the project on the introduction, distribution and management of noxious terrestrial and aquatic weeds
E31	Remove non-native plant species around lake, river, forebay and afterbay areas especially star thistle, ailanthus, and other invasive plant species		See T7

TE32	DWR and DFG to work cooperatively to preserve hunting and fishing opportunities in the afterbay and borrow areas, and Lake Oroville		See T6, R6
TE33	Fuel load on state lands – potential impact to habitat (wildlife and human)		See T11, LM2
TE34	Favor riparian dependent resources and limit disturbance in all riparian areas including riparian and aquatic ecosystems, wetlands, stream banks, and floodplains		See T3, T5
TE35	Favor riparian resources over other resources, except cultural resources, in cases of conflict		See T5
TE36	Manage the Feather Falls Scenic Area as a Semi Primitive Non Motorized area		See R5
TE37	Assure adequate protection of riparian area for Wildlife and fish resources		See T5
TE38	Evaluate and mitigate bank swallow habitat impacts (threatened)		See T2
TE39	Manage flows and/or reservoir storage to maintain or enhance riparian plant communities and habitat for all life stages of fish. Cooperate with local, State, and other Federal water management agencies. Protect riparian areas while providing developed facilities		See T1, T3, T4, T5, T6, F1
TE40	Native plant landscaping (potential sites: Feather River fish Hatchery, State Parks Headquarters, DWR Field Office, Spillway Launch Facility - future) and restoration of native plant communities.		See T3, T4, T7
TE41	North forebay – preservation of existing wildlife		See T1
TE42	Include aquatic species of non-native plants		See T7

TE43	Improve access to all areas in the afterbay and barrow area		See R1
TE44 a	Preserve wildlife habitat in the diversion pool area		See T1
TE44 b	trespass, grazing leases, acquisition of additional land within the project boundary for wildlife management		See T6, LU1, LU2
TE45	ESA compliance, want to hear about conflicts with folks and other species (bald eagles)		See T2
TE46	Improve terrestrial habitat with introduction of salmon (bears)		See T1, T2
TE47	Continue inventory of plant and animal species in the project area		See T1, T4, T7, T8
TE48	Protect riparian habitat in project area		See T1, T5
TE49	Responsible management by resource agencies		See T6
TE50	Effects of fluctuating water levels in afterbay on wildlife		See T1
TE51	Restoration of areas used as stockpile sites during dam construction		See T1, T7
TE52	Evaluate quality of vernal pools in the project boundary and project operation on health/quality of pools		See T3, T5
TE53	Biological Evaluation of species of concern from BLM and USFS (Plumas and Lassen NF) perspective Surveys should include Region 5 Sensitive plant and animal species as well as Plumas National Forest Special Interest plant species.		See T2

	California Department of Fish and Game Draft Letter, January 23, 2001		CONSOLIDATED ISSUES LIST
TE54	Evaluation of funding adequacy for Oroville Wildlife Area		See T6

TE55	Evaluation of funding adequacy for law enforcement		See T6
TE56	Adequacy of survey information to document the presence of state or federally listed plant or animal species that are potentially impacted by project operation		See T2
	State Water Resources Control Board Letter, February 28, 2001		CONSOLIDATED ISSUES LIST
TE57	Effects of reservoir surface elevation fluctuations on wildlife habitat		See T1, T2, T3
TE58	Effects of changes in the magnitude, frequency and timing of peak flows in the Feather River on riparian vegetation recruitment in the low flow reach and immediately downstream of the Afterbay		See T5, G1

	California Waterfowl Association e-mail, March 6, 2001		CONSOLIDATED ISSUES LIST
TE59	Operate water levels in Thermalito Afterbay to prevent adverse impacts to Pacific Flyway waterfowl, especially during nesting in spring and early summer; continue to coordinate with DFG		See T1, T2, T9
TE60	Evaluate effects of proposed increases in recreational activity in Thermalito Afterbay on waterfowl and other wildlife	T9	Effects of existing and future project-related recreation facilities, activities (including authorized and unauthorized access and use) and management on nesting and wintering Pacific Flyway waterfowl, other wildlife, and plant communities See T1, T2

	U.S. Fish and Wildlife Service Letter March 19, 2001		CONSOLIDATED ISSUES LIST
TE61	Project effects on downstream riparian habitat and the reservoir shoreline, including on-going effects of reservoir operations and recreational uses; effective stabilization, restoration and enhancement measures		See T3, T5

TE62	Protection and sustained conservation of terrestrial wildlife and flora in the project-affected area; comprehensive and well-crafted planning		See T1, T2, T4, T9, T10
	Task Force and Work Group Meetings, March 19 and 20, 2001		CONSOLIDATED ISSUES LIST
TE63		T10	Effects of existing and future project features, operations and maintenance on upland habitat, including , revegetation and restoration efforts
TE64		T11	Effects of existing and future fire prevention/fuel load control on natural communities.

GEOLOGY, SOILS AND GEOMORPHOLOGY ISSUES

FEBRUARY 12 LIST		CONSOLIDATED ISSUES LIST	
GE1	As needed, remove excavated material from the floodplain		See W7
GE2	Project features and operations alter the hydrology of the system, creating the possibility for scour zones within both natural and designed channels. What effects do discharge and ramping rates have on substrate scour and the mobilization of sediments into the water column downstream		See G5, W8, E6, F6
GE3	Alterations in stream hydrology affect the natural fluvial geomorphologic processes of a riverine system. How has the change in magnitude, frequency and timing of peak flows and rates of flow change on the Feather River affected riparian vegetation recruitment in the low-flow reach and immediately downstream of the Afterbay, under wet and dry year criteria	G1	Effects of existing and future project operations on natural geomorphic processes. These include physical attributes and functions (e.g., channel morphology, channel stability, sediment transport and deposition, spawning gravel and large woody debris recruitment, habitat diversity) and subsequent effects on biological resources (e.g., aquatic macro-invertebrates, riparian vegetation) in the low-flow section and in the Feather River downstream of Thermalito Afterbay under wet and dry year criteria. Also, see W8,F3,F10, T5.

GE4	Under existing conditions, are bankfull flows frequent enough to maintain channel morphology, sediment transport, habitat diversity and adequate gravels for salmonid spawning and rearing in the low-flow section and in the river downstream of Thermalito Afterbay		See G1, F3, F6, F10
GE5	Under existing conditions, are the moderate winter floods and bankfull flows adequately recruiting the amount of large woody debris needed to maintain adequate salmonid rearing habitat in the low-flow section and in the river downstream of Thermalito Afterbay		See G1, F3, F10, FE38
GE6	How will the future demand for project water change the timing and duration of moderate winter floods and bankfull flows in the low-flow section and in the river downstream of Thermalito Afterbay		See G1, W8, FE84

FEBRUARY 12 LIST, CONTINUED		CONSOLIDATED ISSUES LIST	
GE7	Are the present streamflows defined under the SWP Feather River Flow Constraints adequate for maintaining natural fluvial river functions in the low-flow section and in the river downstream of Thermalito Afterbay (i.e., diversity of habitats: pool to riffle ratios, pool depth, stream bank angle, stream bank stability, stream bank vegetative cover, bedload deposition pattern, and stream bank vegetation root depth versus stream bank height above bankfull height)		See G1, F1, FE33
GE8	Evaluate channel capacities and potential need for more storage/flood protection engineering and operations deflection into levees by gravel bars	G2	Project effects on channel capacity and potential need for more storage/flood protection. Also, see E4, F10, FE38, FE39
GE9	Channel morphology and changes from operation – armoring spawning habitat and lateral erosion of banks		See G1, F6, FE37, FE54

GE10	Has the project resulted in sediment starvation (e.g., reduced gravel recruitment) to the lower river, and if so, by how much		See G1, F6, FE37, FE54, FE56
GE11	Riffles for culturally significant activities (spearfishing rights) are rare and the area where riffles currently exist is protected		See CR2, CR3
GE12	River flows through low-flow sections (historically 1,600 cfs, now 600 cfs) have changed – what is the effect on channel morphology, physical processes and biological habitat.		See G1, FE86, FE95, FE96, FE97
GE13	Do analysis and mitigation on a watershed basis		Address in study plans. See WE11, WE14
GE14	Cooperate with local, State, and Federal agencies as well as private landowners in long-range watershed planning. Use an interdisciplinary approach.	G3	The need to coordinate long-range watershed planning activities with local, state and federal agencies and private landowners. See WE15
GE15	Avoid water quality degradation by using Best Management Practices during land management activities, and reduce sedimentation and channel erosion by rehabilitating deteriorating watersheds		See W7, T3, WE11, WE13
GE16	Coordinate with counties, Cal-Trans, and the Union Pacific Railroad to eliminate the sidecasting of waste material along travel ways, except at designated locations		See W7 and W15

FEBRUARY 12 LIST, CONTINUED		CONSOLIDATED ISSUES LIST	
GE17	Reduce sediment yields from watersheds in deteriorating conditions and those tributary to eroding channels or hazardous flood prone areas		See W7, T3, T5, WE11, WE13
GE18	Re-vegetate disturbed areas within the floodplains to stabilize soil, benefit fish and wildlife, and restore the natural flood control qualities		See W7, T3, T5, WE8

FEBRUARY 26 LIST		CONSOLIDATED ISSUES LIST	
GE19	Gravel recruitment impacts of the dam – both up and down stream	G4	Project effects on sediment accumulation upstream of the dam. Also, see G1, F6
GE20	Indicators of hydrological alteration (IHA analysis)		Address in study plans, See FE84, F1, F3, F10, WE49
GE21	Effect of project on recruitment of ocean beach sands	G6	Cumulative effects of project facilities and operations on sediment movement and deposition (e.g., recruitment of ocean beach sands) and other geomorphic processes (e.g., maintenance of a satisfactory abiotic habitat template). Also see F12, W16
GE22	Effect of accumulated sediment on lake bathymetry of Lake Oroville		See G4
GE23	Releases that reflect nature cycles benefit biological cycles – how have changes in seasonal release patterns affected fish, invertebrates, and their habitat		See G1, F1, F3, F10, WE49

NMFS LETTER		CONSOLIDATED ISSUES LIST	
GE24	Direct, indirect, and cumulative impacts of project facilities and operations on sediment movement and deposition, river geometry, and channel characteristics. This includes impacts on stream competence, capacity, bank stability and extend, duration, and repetition of high flow events		See G1, G6, W15, F6, F12

USFWS LETTER		CONSOLIDATED ISSUES LIST	
GE25	<p>Natural geomorphological processes historically occurred within the Feather River watershed and are the result of geologic and hydrologic processes such as weathering, erosion, runoff patterns, material transport and deposition. Project features and operations have altered these natural geomorphic processes. Alteration of these geomorphic processes has affected the riverine habitat and species that depend on it. The FWS is concerned that project operations may have taken us beyond some critical thresholds for ecosystem sustainability. We are concerned that maintenance of a satisfactory abiotic template (e.g., substrate used for invertebrate production and fish spawning) is not occurring). The FWS wants assurance that new license conditions will allow for minimum thresholds of geomorphic processes to take place thus ensuring sufficient natural sediment movement and a satisfactory abiotic habitat template are in place</p>		See G1, G6, F1, F3, F6

RECREATION AND SOCIOECONOMICS ISSUES

RECREATION/SOCIOECONOMICS MASTER LIST		CONSOLIDATED ISSUES LIST	
RE1	Existing recreational facilities are not adequate to meet demand	R1	Adequacy of existing project recreation facilities, opportunities, and access to accommodate current use and future demand.
RE2	Upgrade all facilities and develop more areas for recreation		See R1
RE3	Look at future and reliable funding sources for recreational development	R5	Appropriate recreation funding, development and management structure.

RE4	There is an interest in integrating recreation opportunities provided by the reservoir with those that could occur on adjacent national forest system lands. Uses need to be complimentary with no unmitigated impact on heritage resources and little if any impact on aquatic and terrestrial wildlife habitat or vegetative productivity. Opportunities could include boat in camping sites, trails from the reservoir to points of scenic or other interest and improvement of existing road access to the reservoir. (Plumas National Forest)		See R5, L1, L4
RE5	Improve Loafer Creek facilities		See R1
RE6	Finish Feather River Enhancement Project		See R1
RE7	Increase camping facilities		See R1
RE8	At Lime Saddle Memorial Park, build it out and extend it to capacity to which it was originally designed. Up to 250 campsites and boat ramp, swimming beach.		See R1, L1
RE9	Develop campground at the Afterbay		See R1
RE10	Develop smaller, primitive style campgrounds (tent) particularly around Enterprise boat ramp		See R1
RE11	Encourage use of the Forebay RV parking facilities		See R1
RE12	Convert floating campsites for winter use		See R1
RE13	The access road from Berry Creek needs improvement and campground facilities are needed lakeside.		See R1
RE14	Increase parking facilities		See R1
RE15	Provide more parking at Bidwell Canyon		See R1
RE16	Open spillway road to Potters Ravine for recreation development.		See R1

RE17	Widen Hwy 162 to Miners Ranch Road		See R1
RE18	Develop monorail system to Butte County		See R1
RE19	Upgrade roads to facilities		See R1
RE20	Improve access from the north		See R1
RE21	Develop an alternative route to and from Lake Oroville area. From east to west, Miners Ranch Road, converging with Foothill Boulevard, and out Ophir Road to Hwy 70.		See R1
RE22	Widen Hwy 162 as originally planned and encourage all levels of government to widen Hwy 70 to Oroville.		See R1
RE23	Build bridge from Nelson Ave Sports Complex to North Forebay and supply gas to site.		See R1
RE24	If there is going to be paving, consider Burma Road (more cost effective with no conflict of use)		See R1
RE25	Immediate access by public vehicles at Lakeland Boulevard to the old railroad grade area of the diversion pool with future consideration of improvements in that same area.		See R1
RE26	Increase marinas		See R1
RE27	Establish and locate area for bass tournaments on the lake and include stands, parking, water, electricity, vendors, boats, etc.		See R1
RE28	Develop facilities (including grandstands, toilets, and campgrounds) at the Forebay/Afterbay to support competitive powerboat events		See R1
RE29	Include a marina and launching of boats along with many recreational activities at the Afterbay, with the entrance to the facilities off Hwy 99		See R1

RE30	Improve or extend roads at Vinton Gulch and Nelson Bar Road (both east and west) to the 800-foot level and increase parking and turn around for car-top launch only. At Nelson Bar east, create a parking area for local residents and install a walking path on the island to the 800-foot level. (LOFEC)		See R1
RE31	Re-establish a boat launch for river usage by powerboats and canoes with an improved launch ramp on the west side of the River in the Wildlife area. (LOFEC)		See R1
RE32	Re-establish and open the road to and from the Cherokee Road area to the Bloomer boat-in area and improve the access parking area at Dark Canyon. (LOFEC)		See R1
RE33	Improve Ponderosa Way Trail to the Las Plumas Power House and consider adding camping and launch ramp to the east side of the North Fork Feather River. (LOFEC)		See R1
RE34	Develop a management structure and funding for aquatic center programs at the north Forebay to bring boating safety and handling to the public		See R1
RE35	Expand use of facilities for boating education and water boat training (like Butte Sailing Club offers)		See R1
RE36	Tournament water skiing location		See R1
RE37	Open forks of lake for boating activity by changing regulations and gating the log booms for access		See R1
RE38	Loss of whitewater recreation opportunities and potential mitigation for loss (whitewater park)		See R1
RE39	Provide houseboat anchor sites		See R1

RE40	Numerous proposals are being made within the Recreational and Socioeconomic Work Group to substantially increase the use of the Afterbay for boating, camping, and other activities. It is important that the environmental impacts of each of these proposals be carefully assessed so that waterfowl and other wildlife on the Afterbay are not adversely affected. (California Waterfowl Association)		See T9
RE41	Investigate potential for shooting carp activity at Oroville		See R1
RE42	Long-term cold and warm water fisheries management plan	R6	Appropriate management of fisheries and wildlife resources to provide recreation opportunities
RE43	Clean out the silt of all ponds and remove excess brush around ponds with clear paths to each and plant some warm water fish to each. One Mile Pond, plant with rainbows and brook trout and increase camping sites. (LOFEC)		See R6
RE44	Consider changes in flow rates on recreational fishing	R3	Effects of facilities operations on recreation and socioeconomic opportunities.
RE45	More emphasis on steelhead and less on salmon		See R6
RE46	Encourage continuation of bass rearing program (as plants)		See R6
RE47	Establish new lake records for fishing and establish a record keeper (group or business) (LOFEC)		See R6
RE48	Establish bank-fishing sites along sloping banks around all campground areas – Parrish Cove, Foreman Creek, Bloomer Boat-in, Goat Ranch Boat-in, Loafer Creek. (LOFEC)		See R6
RE49	Re-survey rivers and Oroville Lake for depth and mark dangerous areas with buoys. Publish new depth charts and make available to the public. (LOFEC)	R2	Adequacy of public safety at the Oroville Project recreation facilities.

RE50	Lake Oroville releases made for power generation may cause dramatic fluctuations in the lake level. What are the potential impacts of fluctuation zone and surface elevation change on recreation opportunities and on fish and wildlife habitat? (SWRCB)		See R3
RE51	Lake levels drop too low in the summer for boaters		See R3
RE52	Has DWR completed or met all its obligations for recreation mitigation (wildlife habitat and fishing) under the existing FERC license? (CDFG)		See R1
RE53	Create swimming facility (year-round) at Loafer Creek Recreation Area or other appropriate place to replace swimming lost when Bidwell Bar was inundated.		See R1
RE54	Water temperature below dam is too cold for swimming		See R3
RE55	North Forebay development and visibility of swimming opportunities – sand beach surround		See R1
RE56	Site improvements to existing flying site for model airplanes		See R1
RE57	Improve the Off Hwy Vehicle Recreation Area (SVRA) at the Oroville complex. This would include and not be limited to 4x4 areas for training, safety, but also moto-cross type tracks also.		See R1
RE58	Larkin Road Shooting Range owned and maintained by the state off Larkin Road south of the Oroville Airport. Enhance parking area, accessibility and drainage.		See R1

RE59	Open the Feather River to gold dredging from Hwy 70 bridge to and through the Wildlife area. Limit to 4" dredge, high banking, sluicing, and panning allowed and establish a building for concession and educational displays. Open from Memorial Day to Labor Day – establish a gold marketer to buy and sell gold and related items to gold recovery in the Feather River. Attraction would be closed during salmon and steelhead runs. (LOFEC)		See R1
RE60	Build an information center at the main entrance off Larkin Road for the Wildlife Area. (LOFEC)		See R1
RE61	Create a mining display visible from Hwy (dredge equipment, etc.)		See R1
RE62	Consider acquiring the Campbell Hills property to continue existing uses such as hang-gliding, kite flying, paragliding, radio-controlled plane flying at area bordering Thermalito Forebay Recreation Area.		See R1
RE63	What is the recreational value of hunting and fishing on project lands and how can they be enhanced? (DPR)		See R3
RE64	Increase hiking trails		See R1
RE65	Build pedestrian bridge adjacent to Hwy. 70 bridge. (Possibly in conjunction with train bridge – multipurpose)		See R1
RE66	Develop more bike trails that are separate from hiking and equestrian trails		See R1
RE67	Build a trail starting at the Feather River Hatchery and continuing down river to access the proposed Hwy 70-bike/pedestrian crossing. Create picnic and river access areas on this stretch of the Feather River.		See R1

RE68	Feather River trails – as proposed by the Bike Pathway Project, links of this access will be created under the Upper Thermalito Bridge and between the Diversion Dam and the old Feather River Railroad.		See R1
RE69	Create comprehensive, integrated trail links around the Project.		See R1
RE70	Move the security fence off the trail access at the Feather River Hatchery.		See R1
RE71	Finish building the CA riding and hiking trail from Oroville Trail to Pacific Crest Trail.		See R1
RE72	Develop an endurance trail around the lake perhaps connecting to Pacific Crest Trail and preserve existing hiking and equestrian trail (in particular, preserve the Dan Beebe Trail as a historical equestrian and hiking trail)		See R1
RE73	Open diversion dam as trail linkage. Create trail linkage from diversion dam to old railroad grade at the railroad trestle. Open west side of the river from the fish barrier dam to Burma Road as recreation area. Move fence back from riverbank at fish hatchery and develop trail from Table Mountain Bridge past the Hwy 70 bridge on north side of river.		See R1
RE74	Provide overnight equestrian parking and camping facilities at existing facilities. Improve Lakeland Equestrian Parking Area as follows: expand parking area portable toilets, picnic tables, metal hitching posts, potable water, native trees planted for shade. Consider providing facilities for overnight camping, and maintain all areas as pavement free.		See R1

RE75	Install directional/rule signs for trails at parking areas and along trails, provide ranger enforcement of the rules.		See R1, L2
RE76	Provide multi-use trails		See R1
RE77	Evaluate unpaved status of RR grade multi-use trail		See R1
RE78	Improve Saddle Dam Equestrian Parking area by adding watering trough, picnic tables, metal hitching posts and planting native trees for shade on the perimeter, expand parking area for major events. Maintain all areas as pavement free. This should apply to the Visitor Center Staging Area as well		See R1
RE79	Replace water trough that was removed from below the OWID ditch to a location nearby, as well as obtaining equestrian input as to watering locations on all present and future trails.		See R1
RE80	Add picnic tables and hitching posts at Long Bar Pond, Glen Pond Meadows, and in an open area near the OWID ditch east of the Oroville Dam Highway crossing as well as at all staging areas.		See R1
RE81	Add picnic tables and benches across from and at the Oroville Dam Spillway along the railroad grade and old construction road, multi-use sections of trail.		See R1
RE82	Evaluate potential for equestrian amphitheater/rodeo arena/multi-use/boarding facility at Larkin area, Thompson's Flat or a suitable alternative site with accessibility to existing Oroville equestrian trails		See R1
RE83	Temporarily rough clear/grade some sections of the trail used for the annual LOVER equestrian event, including an alternate route, parallel to the bike route, up the south side of the dam for horses to use during LOVER ride.		See R1

RE84	Continue Lakeshore habitat improvement.		See R1, R5, R6
RE85	Upgrade portable restrooms to permanent ones at various locations		See R1
RE86	Water lines at the day use area along the river between the Fish Barrier Dam and the Diversion Dam need to be installed to irrigate plantings. Restrooms and day use area improvements are also needed. Clean up old 'City' park adjacent to the Fish Barrier Dam, just north of the Fish Hatchery. Provide picnic areas and restroom facilities.		See A1
RE87	Need to establish a debris collection program on regular schedule	R4	Adequacy of maintenance and clean-up activities associated with recreation areas.
RE88	Remove old Rail Road trestle and other debris from river.		See R4, A1
RE89	Clean up shoreline, particularly adjacent to camping and public access areas. Use county prisoner-release programs if necessary, to maintain clean shorelines.		See R4, A1
RE89	Remove concrete and construction debris in Feather River including below the Fish Barrier dam, below the Table Mountain Bridge, below the Hwy 70 bridge.		See R4, A1
RE90	Dump areas used by DWR need to be removed.		See R4, A1
RE91	Evaluate fuel loading in areas within the Project area, including land along the Feather River below Oroville Dam through the Long Bar area and land near the Diversion Dam.		See R4, L3
RE92	Install warning system for water releases.		See R2, L8
RE93	Provide an emergency boat for CDF		See R2, L8

RE94	Evaluate existing lake security and need for increased personnel		See L2
RE95	Create, enhance and preserve Craig Access Park		See R1
RE96	Restore and improve recreation resource along the river corridor from the dam, downstream to the wildlife area		See R1
RE97	Camouflage the powerline towers		See A3
RE98	Various recreational and public use facilities were designated as mitigation measures to minimize impacts resulting from the original Oroville Project construction. The Licensee should provide a complete inventory of recreational mitigation obligations required by Articles of the existing FERC License, and should clearly disclose the current status of compliance with those measures. (SWRCB)		See R1
RE99	There is an interest in reviewing the arrangement to defer recreation management to the California Department of parks and Recreation for the purpose of determining whether to continue, modify or terminate this agreement. The arrangement if continued needs to be formally documented and updated to reflect current management direction. (Plumas National Forest)		See L4
RE100	Replace landscaping at the Feather River Fish Hatchery and adjacent river areas.		See A1
RE101	Create work team to remove invasive, non-native plants (List A and B) from State Water Project and DWR areas.		See A1
RE102	Re-seed face of Oroville Dam and perimeter of reservoir exposed during drawdown.		See A1, A2

	FEBRUARY 12 LIST*		CONSOLIDATED ISSUES LIST
RE103	Establish and locate area for bass tournaments on the lake and include stands, parking, water, electricity, vendors, boats, etc.		See R1
RE104	Develop bank fishing sites, cutaways used as fish habitat		See R1
RE105	Traditional fishing activities that were impacted by construction of dam		See R1, R5 (need Cultural Resources cross-reference)
RE106	Trophy fishing in North Fork Feather River.		See R3
RE107	Work together with DFG to preserve and continue hunting and fishing opportunities in the after-bay and borrow areas		See R3, R6
RE108	Consider changes in flow rates on recreational fishing		See R3, R6
RE109	Efficiently manage recreation in the Lake Oroville State Recreation Area		See R3, R6, L4
RE110	Various recreational and public use facilities were designated as mitigation measures to minimize impacts resulting from the original Oroville Project construction. The licensee should provide a complete inventory of recreational mitigation obligations required by Articles of the existing FERC License, and should clearly disclose the current status of compliance with those measures		See R5
RE111	Manage the Wild and Scenic Zones of the Middle Fork of the Feather River consistent with the Wild and Scenic Rivers Act		See R5
RE112	Continue cooperation allowing the California Department of Parks and Recreation to manage the reservoir area including Plumas National Forest lands		See R5, L1, L4

RE113	Manage the Feather Falls Scenic Area as a Semi Primitive Non Motorized area		See R5?
RE114	Manage flows and/or reservoir storage to maintain or enhance riparian plant communities and habitat for all life stages of fish. Cooperate with local, State, and other Federal water management agencies. Protect riparian areas while providing developed facilities		See R3
RE115	Elaborate on the management of the feather falls scenic area		See R5
RE116	Look at what happens to money developed from power generation and potential to put into community. Have an economist evaluate the implications of promises versus delivery. Look at history to understand the perspectives of the community over the last 30 years.	S1	Improve economic development through recreation- opportunities at the Oroville Facilities.
RE117	Develop way to bring power and water directly from the project to the City of Oroville to stimulate economic development.	S2	Assess the feasibility of economic development through lower local utility rates and or other available economic options related to project resources.

CULTURAL RESOURCES ISSUES

MAY 8 LIST		CONSOLIDATED ISSUES LIST	
CRE1	Protect all cultures' cultural resources (including but not limited to: Indian burial sites, sacred sites, massacre sites, co-habitation sites, trails, etc.) within the Project boundary area.	CR2	Evaluate the need and methods to provide protection of cultural resources (including archaeological sites, historic resources, and traditional use areas) within the Area of Potential Effects. Also, see LU1
CRE2	Hunting and fishing rights, traditional fishing activities, and water rights are gone – evaluate impact of project on those	CR1	Determine the nature, distribution and value of cultural resources (including archaeological sites, historic resources, and traditional use areas) within the Area of Potential Effects. Also see CR2, CR3
CRE3	Need to involve all Tribes, not just federally recognized ones		See CR1, CR2

CRE4	Develop Heritage Village	CR4	Provide for the interpretation of cultural resources and make available cultural resources data relative to the Oroville project area.
CRE5	Protection of cultural sites along RR grades		See CR2
CRE6	Add island off eastern side of Nelson Bar Road as a historical area.		See CR2
CRE7	Need more cultural education in the area affected by the project. Develop a fund for community education to resolve disputes between various groups and create better understanding.		See CR4
CRE8	When considering cultural endeavors, achieve equal opportunity for all people	CR3	Determine the effects of existing and future project facilities, operations and maintenance (including recreational developments and other land use decisions) on cultural resources within the Area of Potential Effects. Also, see CR1, CR2, CR4
CRE9	Cultural resources that lie beneath the reservoir need to be considered for protection		See CR2
CRE10	Tribes want input on all issues and want to be actively involved in this process		See CR1
CRE11	Desire jobs and training for tribal members on this project		See CR1, CR2, CR3, CR4
CRE12	Complete area needs to be surveyed- area within the Project boundary including land within the fluctuation zone.		See CR1
CRE13	Unfinished reports should be brought up to date first.		See CR1

CRE14	Butte County State collections need to be located and returned to the county and any further work done on the collection should be done within the county. Develop a curator facility for all tribes to use that could house all the collections and investigate possible loan from Smithsonian.		See CR4
CRE15	Develop collection policy to evaluate 'in-place' artifacts (on case by case basis)		See CR1, CR2
CRE16	Local schools and tribal members should have access to artifacts for educational purposes		See CR4
CRE17	Burial and other tribal lands set aside for protection of past and use for future (State and/or BLM lands). Set aside land for repatriation and future use (consider State and/or Federal lands).		See CR2, CR4, LU2
CRE18	Local members of the Native Tribal community that contribute to information should be compensated		See CR1, CR2, CR3, CR4
CRE19	Want artifacts that are found to stay in the community		See CR4
CRE20	Re-burial of exhumed bodies currently stored in West Sacramento; funding needed for transportation, land and assistance to cover costs of re-burial		See CR4, LU2
CRE21	Area 1 is rich with cultural resources and prime location for preservation. Concerned that increased recreational activities in the area is in conflict with protection of cultural resources		See CR1, CR2, CR3
CRE22	Support protection – want to see preservation of cultural resources and don't want to see them loose their identity (physical and knowledge identity)		See CR2

CRE23	Concerns for repatriation		See CR4
CRE24	Consider issues on a watershed level, involve all tribes		See CR1, CR2
CRE25	Concerned about Area 2 development – extension and potential impacts to cultural resources in area		See CR1, CR2, CR3, LU1
CRE26	Water drawdown (particularly bad this year) has exposed sites which are then subjected to vandalism. Concerned that County is not prosecuting offenders.		See CR2, CR3, LM4
CRE27	Desire to see development of a Maidu cultural center with access for all to the center.		See CR4
CRE28	There is an interest in inventorying heritage resource and traditional gathering sites located on state, Federal and PG&E lands located within and adjacent to the project and determining the risk posed to these sites from project operations, future development or vandalism. The inventory should also include a plan to conserve at-risk sites.		See CR1, CR2
CRE29	Culture - bearers that contribute to information should be compensated		See CR1, CR2, CR3, CR4
CRE30	Consider changing name of the Lime Saddle campground and potential cultural center there.		See CR4
CRE31	Interest in performing DNA testing to determine tribal relationships (tribe by tribe decision) (molecular level)		See CR1
CRE32	Ethnographic work done on cultural resource elders (post 1950's and 60's)		See CR1
CRE33	Beckwourth trail and Robinson's Corner		See CR1, CR2
CRE34	Survey Indian trails and their significance (migration and local use trails)		See CR1

CRE35	History and historical archeology need to be addressed		See CR1, CR2
CRE36	Consider extension of Berry Creek Rancheria to include river corridor to Bald Rock Dome		See CR2
CRE37	Preservation and interpretation of historic mining and ranching sites		See CR1, CR2, CR4
CRE38	Public education to combat vandalism of sites.		See CR2, CR4
CRE39	Ownership map showing lands purchased by state during facility construction		See CR1, LU2
CRE40	Establish ecological, paleontological and environmental baseline for cultural resource studies		See CR1
CRE41	Consider fuel loading (CDF) and wildlife management activities on cultural resources particularly in Area 3.		See CR1, CR2, CR3, LM2
CRE42	Identify and set aside new traditional gathering sites		See CR1, CR2, LU2
CRE43	Land for Ishi monument		See CR4
CRE44	Finish Maidu village display at the visitor center		See CR4
CRE45	Inundation and debris study and impacts to cultural resources in shoreline and fluctuation zone.		See CR1, CR2, CR3
CRE46	Tribe (Mooretown) wants permanent full-time State Archaeologist at Oroville who would preferably work for Department of Water Resources.		See CR2
CRE47	Complete the Maidu Culture Exhibit at the Visitors Center		See CR4

CRE48	Move the Jim Bechwourth exhibit to another place in the Visitors Center. It now appears to be part of the world of the Maidu people exhibit and that is inappropriate. He was a famous black trapper, scout, pioneer settler in 1850's California and founder of the wagon trail pass, now Highway 70.		See CR4
CRE49	Funds to finish the Maidu Diorama at the Lake Oroville Visitor Center		See CR4
CR50	Have State Archaeologist work under DWR instead of DPR. I, (Bruce Steidl) and the Tribe would want the best environment for our contact during the relicensing process and the years to come. DPR is constantly having problems with funding for positions.		See CR2
CRE51	In the IIP, page 244, 5 th paragraph down states the Stage 2 Survey may include a comprehensive on foot inventory of impact areas that have a reasonable possibility for containing sites. We ask for nothing less than 100% inventory when physically able to do so. This includes under the high water level as well. To not do this would be negligent.		See CR1
CRE52	Define legal and fiscal responsibility for archaeological and other cultural resource protection/preservation: land owner (DWR) vs land management agency (DPR). What recommendations have been made to protect cultural resources throughout the past 36 years and what has been done to carry out/fund these recommendations. How much has been spent over the past 36 years to protect cultural resources and assurance that whatever is developed here will have adequate funding for the future. Lack of stable funding source for cultural resources (protection, curation, position at facility). Conditions of existing license.		See CR2

CRE53	Definition of Area of Potential Effect (APE) for project. Ownership map that shows all state land in vicinity of DWR defined project area that were acquired as a result of the project. Lake Davis, Frenchman Lake, Antelope Lake dams: built for State Water Project at same time as Lake Oroville dam: what is their relationship to this project.		See CR1, CR2, CR3
CRE54	Difference of cultural resource protection within state park units. On OHV parks, vehicles are not allowed to drive on archaeological resources; why are vehicles allowed to drive over and damage archaeological sites during reservoir drawdown?		See CR2
CRE55	Traditional land management practices need to be incorporated into areas that are defined as traditional Cultural Properties/gathering areas.		See CR1
CRE56	DPR NAGPRA inventory for archaeological collections only, ethnographic objects collected in the Lake Oroville area during project activities need to be inventoried in a searchable database that includes provenience information. Current software (ARGUS) is not available to researchers and DPR staff is unable to search by provenience information.		See CR4
CRE57	Find, reanalyze, and repatriate to Butte County all collections that are part of all project activities (i.e. looking at UCLA, ARC, Chico State, Sacramento State, Markley's mid-70's excavations).		See CR1, CR4
CRE58	Loss of Traditional Cultural Landscape and activities. Cultural identity damaged.		See CR1, CR3, CR4

ENGINEERING AND OPERATIONS ISSUES

April 17 LIST		CONSOLIDATED ISSUES LIST	
EE1	Consider adding additional generating capabilities (some existing infrastructure).	E1	Evaluate the potential for adding additional generation using existing infrastructure, modifying facilities to increase storage and associated generation, and changing operation to provide spinning reserve (e.g., motoring)
EE2	Intake on North side of dam - Afterbay outlet motoring to provide spinning reserve.		See E1
EE3	Use real-time hydraulic projections, inflow/outflow rather than yearly projections.	E2	Evaluate the potential to improve operations through use of real-time watershed hydrologic projections for flood and non-flood conditions.
EE4	PLC upgrades?	E4	Evaluate environmental and economic aspects of different flow regimes using support system models as a tool (see Issue E2 above). Factors to be considered include timing, magnitude and duration of flows, pump-back scheduling and maintenance scheduling, and hatchery operations.
EE5	Coordination with releases from other water storage facilities? - for fisheries protection CVP facilities preventing straying of salmon and steelhead.	E3	Evaluate potential for improved coordinated operation of Oroville Facilities through additional coordination with other water storage facilities and regulatory and resource agencies (e.g. CALFED). Also, see F11
EE6	Coordination and evaluation of DF & G, USFWS and other regulatory agencies release requirements to better fit with reality. High agency level decision.		See E3, F11.
EE7	Potential to use support system models to evaluate different flow regimes with historic and real-time information.		See E4.

EE8	Why is there no requirement to maintain minimum emergency storage at Lake Oroville? (Evaluate needs related to other resources.)		See E4.
EE9	Any plan to address increasing siltation in lake?	E8	Effect of reservoir sedimentation and sediments on project operations. Also, see G4, G5.
EE10	Ramping rates effects on downstream facilities.	E6	Effect of ramping rates on downstream facilities, power generation, water supply, water temperatures, and fish. Also, see F1, F10, W10.
EE11	Coordinate releases with other water storage facilities for flood release.	E5	Impact of flood releases on Lake Oroville dam (including need for access to north side of dam) and downstream facilities including downstream levee stability and potential for ameliorating downstream flooding through coordinated releases with other water storage facilities. Consider past floods, improvements in channel carrying capacities, need for more storage (e.g., installing Obermeyer gates on the emergency spillway ogee), operational changes, early warning system for downstream releases, and updating of flood operation manual.
EE12	Utilize current watershed hydrologic data from planning (coordinate with COE data gathering).		See E2.
EE13	Operational constraints as they relate to other resources and water supply.	E15	Evaluate operation alternatives that maintain or improve current water supply under all operation plans and conditions. Also, see E1, E4.
EE14	Potential physical changes to facility to increase storage and generation. Impacts to existing and potential facilities.		See E1, E15.
EE15	Evaluate temperature requirements and potential Eng. (?) operational modifications	E12	Evaluate operational and engineering alternatives including selective withdrawal from Lake Oroville, Thermalito Afterbay, the hatchery, and the low flow section to meet various downstream temperature requirements.

EE16	Inequity of power pricing structure.	E9	Effect of Oroville Facilities power generation pricing schedule on local economy.
EE17	Update flood operation manual		See E5
EE18	What are 50-year projections for water/power demands and plans to meet those needs and impacts of meeting demands? (Context of existing full allocations.)	E10	Effect of future water demands on project operations including power generation, lake levels and downstream flows. Consider sale of existing water allotments to downstream users.
EE19	Early warning system for downstream releases.		See E5.
EE20	Sale of existing water allotments to downstream users.		See E10.
EE21	Outflow impacts to downstream flood risk (levee stability) COE?		See E5.
EE22	Stability of Oroville levee system through low flow section and effects of high flow.		See E5..
EE23	Evaluate channel capacities and potential need for more storage / flood protection engineering and operations deflection into levees by gravel bars.		See E5.
EE24	What engineering or other reasonable and prudent solutions are available that would prevent the interbreeding of fall and spring-run Chinook salmon in the low flow section of the Feather River (migration barrier and /or flow and temperature changes in the low flow section)?	E13	Evaluate operational and engineering alternatives to prevent interbreeding of fall and spring-run Chinook salmon in the low flow section of the Feather River (e.g., migration barrier and/or flow and temperature changes) Also see, F3, F13.
EE25	Operations and engineering of the project determine the manner and extent water is moved into, through and out of the project area. Current operations, which affect timing, magnitude and duration of flow from current release schedules, pump-back scheduling and maintenance schedules impact both lotic and lentic ecosystems affected by the project. Operations need to be examined and their impacts evaluated and minimized for inclusion into terms and conditions of the settlement.		See E4.

EE26	Facility operations and impact – on bass fishery and spawning activities at Afterbay. (Protect and enhance bass fishery.)		See E4, F3, F1.
EE27	Sediments behind dam (operations).		See E8, G4.
EE28	How do the pump-back operations during the summer months affect water temperatures required for holding and rearing of steelhead and spring-run Chinook salmon in the low-flow section and in the river downstream of Thermalito Afterbay?		See E4, F1, F10, F11, F13.
EE29	Project features and operations alter the hydrology of the system, creating the possibility for scour zones within both natural and designed channels. What affects do discharge and ramping rates have on substrate scour and the mobilization of sediments into the water column downstream? How have turbidity levels been affected by project operation?	E7	Effect of the project including discharge (magnitude, frequency and timing) and ramping rates and the altered stream hydrology on substrate scour, mobilization of sediments, turbidity levels, and riparian vegetation in the low flow reach and downstream of the Afterbay. Also, see G1, G5.
EE30	Alterations in stream hydrology affect the natural fluvial geomorphologic processes of a riverine system. How has the change in magnitude, frequency and timing of peak flows on the Feather River affected riparian vegetation recruitment in the low-flow reach and immediately downstream of the Afterbay?		See E7, G1, T3, T5.
EE31	Impact of project facilities and operations on fish passage. This includes structures, flows and/or water quality conditions that impede or block passage within and from current and/or historic habitat and operations that impact passage or have the potential to enhance passage. Passage includes movement of spawning or holding adults, emigrating smolts, or movement of juveniles to different habitat areas for purposes of feeding, avoiding predators or sheltering.		Issue transferred to Environmental. See F1, F4, W1, W11, W14.

EE32	Adequacy of current in-stream flow requirements to conserve anadromous salmonids, their habitats and forage. This includes providing a range or schedule of flows necessary to optimize habitat, stable flows during spawning and incubation of in-gravel forms, flows necessary to ensure redd placement in viable areas, and flows necessary for channel forming processes, riparian habitat protection and maintenance of forage communities. This also includes impacts of flood control or other project structures or operations that act to displace individuals or their forage or destabilizes, scours, or degrades habitat.		See E4, F11, W10, G1.
EE33	Impact of hatchery facilities and/or operations on anadromous salmonids. This includes the direct, indirect and cumulative impacts of hatchery product on anadromous salmonids and the direct, indirect and cumulative impacts of hatchery facilities and operations on salmonids and their habitats.		See E4, F9.
EE34	Project structures or operations that either have in the past or continue to introduce predators, create suitable habitat for predators, harbor predators, or are conducive to the predation of salmonids.		Issue transferred to Environmental. See F1, F5, F7, F9, F10, F15, F16.
EE35	Impact of project structures and operations on water quality conditions necessary to sustain anadromous salmonids and their habitats.		Issue transferred to Environmental. See W1, W10, W11, W14.
EE36	Direct, indirect and cumulative impacts of project facilities and operations on sediment movement and deposition, river geometry, and channel characteristics. This includes impacts on stream competence, capacity, bank stability and extent, duration, and repetition of high flow events.		See E7, G1, G5.

EE37	<p>One of the most significant environmental changes caused by the Oroville Facilities Project was changing the nature of this relatively low elevation waterway from a lotic to lentic system. The confluence of three tributaries of the Feather River and its free flowing nature has been replaced by Lake Oroville. The transport functions (sediment, nutrients etc.) normally associated with the energy of a lotic system have been replaced by an overall storage function of a lentic system. Thus, there are water quality changes accompanying this shift of ecosystems both within and downstream of the lake. The FWS is concerned about the effects of the current project operations on water quality and changes that may occur with new license conditions. We seek assurance that sufficient numbers of water quality constituents are investigated and that appropriate and rigorous protocols are followed. We seek assurance that investigations will lead to determination of operations alternatives that balance and maintain acceptable water quality standards under all operational plans and conditions set forth in the final agreement.</p>	E14	<p>Evaluate operational alternatives that balance and maintain acceptable water quality standards including those for MTBE under all operational plans and conditions. Also see G1.</p>
EE38	<p>As described in the IIP, operations of the Oroville Facilities including Lake Oroville, have wide-reaching effect on riverine conditions downstream in the Feather River, Sacramento River, and San Francisco/San Joaquin Bay Delta. In addition, water supply stored in Lake Oroville is delivered to Southern California through State Water Project canals and thus has effects on growth and development within the SWP service area. There are a variety of federally listed, threatened, proposed and species of concern that occur within and are supported by suitable habitat in the project affected area. There is potential for license condition changes that could potentially</p>		<p>Issue transferred to Environmental. See F13.</p>

EE38 Cont.	adversely impact listed, proposed, and/or species of concern in areas affected by water supply deliveries (including transfers), flood control, recreation activities and other project operations. The FWS wants to assure that future license conditions and attendant PM&E measures protect listed and proposed species, assist in their recovery and prevent future listings of any species of concern that may be at risk.		
EE39	As follow-up to the above paragraph, the operations of the Oroville Facilities are integrally linked to federal water project operations and those of other entities in the Central Valley. Coordinated decisions for water project operations, including Lake Oroville take place on a daily basis. FWS wants to assure that areal extent of investigation and content of the scope of analysis is sufficient so that ESA requirements are fully addressed with regards to direct, indirect, cumulative, interrelated and interdependent activities. This means examining all facets of project features such as distribution and transmission lines and how their operations/maintenance practices may affect T&E species. How do the pump-back operations during the summer months affect water temperatures required for holding and rearing of steelhead and spring-run Chinook salmon in the low-flow section and in the river downstream of Thermalito Afterbay?		Issue transferred to Environmental. See E4, F1, F10, F11, F13.
EE40	Does the increase in river water temperature that results from warmer Thermalito Afterbay releases during the spring, summer, and fall months limit the amount of suitable steelhead and salmon habitat in the river downstream of Thermalito Afterbay?		Issue transferred to Environmental. See W10, W11, W14, F3, F10.

EE41	Direct, indirect and cumulative impacts of project facilities and operations on sediment movement and deposition, river geometry, and channel characteristics. This includes impacts on stream competence, capacity, bank stability and extent, duration, and repetition of high flow events.		See E7, G1, G5.
EE42	Bedload transport, current condition of habitat potentially impacted by project and alternatives to conserve or enhance		See E7, G1, G5.
EE43	Adequacy of selective withdrawal structure to maximize water temperature for anadromous salmonids.		See E12, W12.
EE44	Priority of salmonid habitat conservation in current operating criteria and various operating agreements.		Issue transferred to Environmental. See F5, F13, F14, F16.
EE45	Introgression occurring between fall-run and spring-run Chinook populations in the Feather River due to hatchery practices and impassable migration barriers.		Issue transferred to Environmental. See F9, F1, F4, W1, W11, W14.
EE46 EE46 cont.	At the first workgroup meeting, a presentation was given on how the water system works from reservoir to Southern California. A chart was shown on Oroville reservoir storage denoting the flood storage limits and elevations at time of year and downstream water requirements for the delta. In the presentation, it was said that the data and chart was from 1971 that DWR in Sacramento was using for those storage elevation levels and acre feet amounts. I question that information and sincerely hope that is not the case.		See E8.

EE47	In the FERC Part 12 guidelines, the Probable Maximum Flood (PMF) is to be examined after each major flood event. The Feather River has had two major flood events since 1971; once in February 1986 and again in January 1997. The FERC Part 12 regulation guidelines also state that when new Hydro-meteorological Reports (HMR's) are issued, the PMF is to be re-examined. New HMR's (HMR 58 & 59) were issued in 1999, thus precipitating the Oroville 2100 project to be re-examined in light of the new data. I think that this has been done for the 2100 project in the last Part 12 inspection and the Work Group should be given the correct data. If not done, the question is why not?		See E5.
EE48	The workgroup should be provided with the last FERC Part 12 inspection in written hard copy done by its Independent Consultant.		Work Group information request.
EE49	Oroville reservoir flood storage chart needs to be updated or obtain a copy of the latest updated chart to be provided to the Work Group.		Work Group information request.
EE50	What is the Hazard classification for Oroville Dam?		Work Group information request.
EE51	Provide the Work Group with the study data done on installing Obermeyer Gates on the emergency spillway ogee to raise the reservoir elevation in a major flood runoff event? What is the probability of this installation?		See E5.
EE52	Provide the workgroup with the latest PMF, HMR, and PMP (probable maximum precipitation) data?		See E5.
EE53	When was the last "Inflow Design Flood" (IDF) study done and was it done on current data?		See E5.

EE54	Effect of tires in Parrish Cove and Bidwell Cove (mosquito abatement).	E11	Effect of tires in Parrish Cove and Bidwell Cove and stakes used to hold down recycled Christmas trees on public safety. (Issue also transferred to Recreation and Environmental.) Also, see F5.
EE55	Effects of stakes used to hold down recycled Christmas trees on public safety		See E11, F5. (Issue also transferred to Recreation and Environmental.)
EE56	Prepare flood inundation maps for a 1997(?) worse case with 300,000 cfs coming out of the dam's normal and emergency spillways. In 1997, it is believed that Oroville storage was almost to a point where the 300,000 cfs of inflow was going to pass through the reservoir. DWR was making plans to evacuate the power plant. The 300,000 would have topped the levees and put 10 feet of water into the town of Oroville.		See E5.

LAND USE, LAND MANAGEMENT, AND AESTHETICS ISSUES

MAY 8 LIST		CONSOLIDATED ISSUES LIST	
LUE1	Develop more areas for recreation	LU1	What are the appropriate, compatible, and potential developmental and non-developmental uses of project lands especially for public use, public access, open space, recreational uses, watershed and natural resources protection/management, energy resources and cultural values in a way that integrates and respects: 1) resource constraints; 2) adjacent land uses; and 3) applicable plans (including the Forest Service, State, County, and City of Oroville land planning and zoning) and policies for project lands and adjacent lands?
LUE2	Develop land access to far north side of lake		See LU1

LUE3	Increase communication on issues relating to present DWR land usage around the lake area so it shifts from unused to recreational or appropriate public use.		See LU1
LUE4	Contact PG&E regarding property at Lime Saddle Marina, the 5 plus acres to add more parking available to public and add much needed road and entrance.	LU2	What is the potential for acquiring or removing project lands (including other property interests) to meet resource goals?
LUE5	Look at all PG&E lands adjacent to project.		See LU2
LUE6	Forbid industrial use of State recreation lands		See LU1
LUE7	Preservation of open/natural areas/greenbelts		See LU1
LUE8	There is an interest in integrating recreation opportunities provided by the reservoir with those that could occur on adjacent national forest system lands. Uses need to be complementary with no unmitigated impact on heritage resources, and little if any impact on aquatic and terrestrial wildlife habitat or vegetative productivity. Opportunities could include boat in camping sites, trails from the reservoir to points of scenic or other interest and improvement of existing road access to the reservoir.		See LU1
LUE9	Potential for acquisition of federal lands (BLM and USFS) within project boundary by DWR.		See LU2
LUE10	Potential for DWR to sell, for private development, some lands currently held by the State. This would get the lands back on tax rolls.		See LU2
LME1	Evaluate existing facilities security. Lake security and fines – “user friendly”.	LM1	What are the funding and staffing needs to adequately address land management for the Oroville Wildlife Area, Lake Oroville State Recreation Area (LOSRA), Thermalito Afterbay, and other project lands? Also, see LM4

LME2	Evaluate unpaved status of RR grade multi-use trail		See LU1
LME3	Immediate access by public vehicles at Lakeland Boulevard to the old railroad grade area of the diversion pool with future consideration of improvements in that same area.		See LU1
LME4	Are additional funds needed to augment the existing budget for the management of the Oroville Wildlife Area? Presently available Fish and Game funds are being dedicated to managing people and not wildlife habitat.	LM4	What are appropriate law enforcement activities, security and penalties for project lands? Also, see LM1
LME5	Are additional funds needed for law enforcement? Presently two-thirds of all the local game warden activities are spent on the Oroville wildlife area. An augmentation of funding for more wardens would free up time for other law enforcement activities outside of the wildlife area.		See LM1, LM4
LME6	Fuel load on state lands – potential impact to habitat (wildlife and human)		See LM1, LM2
LME7	There is an interest in management of national forest system lands located within and adjacent to the project area within the framework of the Forest Plan Amendment EIS. Management could include establishment of Defensible Fuel Profile Zones, prescribed burning or other activities compatible with the EIS.	LM2	What are the existing and future fuel loads, fuel management practices, and coordination of fuel management activities for lands located within and adjacent to the project boundary to manage the risk of loss of property, lives, and natural resources? Also, see LU1, T11.
LME8	There is an interest in reviewing the arrangement to defer recreation management to the California Department of Parks and Recreation for the purpose of determining whether to continue, modify or terminate this agreement. The arrangement if continued needs to be formally documented and updated to reflect current management direction.	LM3	What is an appropriate arrangement for land management of recreation facilities of LOSRA, Thermalito Afterbay, Wildlife area and other project lands?

LME9	Commercial cattle grazing: return to project and impact to natural environment		See LU1
LME10	Consequences on natural environment and adjacent land of fuel loading (current fire management practices)		See LM2, T11
LME11	Comply with the Executive Orders 111988, Floodplain Management, and 11990, Protection of Wetlands		See LU1, T5
LME12	Use site specific, integrated pest management approach to control forest pests, employing mechanical, cultural, biological, and/or chemical methods based on effectiveness, cost-efficiency, and protection of human health and environmental quality		See A3, T7, T8
LME13	Water releases from Oroville Dam and downstream impacts (vegetation and properties)		See G1, G2, T3, T5
LME14	Evaluate fuel loading in areas within the project area, including land along the Feather River below Oroville Dam through the Long Bar area and land near the Diversion Dam.		See LM2, T11
LME15	Install warning system for water releases.		See LM4
LME16	Provide an emergency boat for CDF		See LM1, LM4
AE1	Need to establish debris collection program on regular schedule	A2	What are the effects of construction debris, garbage, and invasive species on the appearance of project lands?
AE2	Remove old railroad trestle and other debris from river.		See A2
AE3	Clean up shoreline, particularly adjacent to camping and public access areas. Use county prisoner-release programs, if necessary, to maintain clean shorelines.		See A2

AE4	Remove concrete and construction debris in Feather River including below the Fish Barrier dam, below the Table Mountain Bridge, below the Hwy 70 Bridge.		See A2
AE5	Dump areas used by DWR need to be removed.		See A2
AE6	Lake levels sink too low in the summer – ‘bathtub ring’	A1	What are the effects of reservoir drawdown on the visual quality at Lake Oroville and other project lands?
AE7	Camouflage the powerline towers	A4	What are the effects of existing and future project features (including transmission lines, trails, etc) and land uses on the aesthetic quality of project lands? Also see A3
AE8	Improve poorly maintained visitor center		See A3, A4
AE9	Expand use of “low impact” signs		See A3, A4
AE10	Consider potential projects that could affect aesthetic nature of the project.	A3	What are the appropriate landscaping, restoration, preservation, vegetation and facilities management/maintenance programs for aesthetic enhancement of project lands? Also see A4
AE11	Day use park: water lines in the south side of the river between the Fish Barrier Dam and the Diversion Dam need to be installed to irrigate plantings		See A3
AE12	Native plant landscaping (potential sites: Feather River fish Hatchery, State Parks Headquarters, DWR Field Office, Spillway Launch Facility - future) and restoration of native plant communities.		See A3
AE13	Replace landscaping at the Feather River Fish Hatchery and adjacent river areas.		See A3

AE14	Clean up old 'City' park adjacent to the north side of the Fish Barrier Dam, just north of the Fish Hatchery. Taken over by DWR when SWP was constructed, never re-opened. Provide picnic areas and restroom facilities. Turn over to City of Oroville.		See A3
AE15	Create work team to remove invasive, non-native plants (List A and B) from SWP and DWR areas.		See A2
AE16	Re-seed face of Oroville Dam and perimeter of reservoir exposed during drawdown.		See A1, A3, A4

Appendix C

Summary of Relicensing Studies Currently Underway

APPENDIX C SUMMARY OF RELICENSING STUDIES CURRENTLY UNDERWAY

INTRODUCTION

A number of environmental studies associated with relicensing of the Oroville facility are currently underway. These studies will contribute toward meeting basic FERC license requirements for PDEA. Results of these studies will also be used by the Work Groups to help identify areas where further investigation may be needed. Current studies are summarized below.

WATER QUALITY

Temperature Model. DWR has been monitoring temperature changes in the Feather River, Thermalito Afterbay, and Thermalito Forebay. A river temperature model, developed by the University of California at Davis (UC Davis) will inform Oroville Project operators on how specific water releases affect temperatures throughout the lower river and will help predict the likely impact of the temperature on river fisheries, recreation, agricultural diverters and the hatchery operations.

AQUATIC RESOURCES

Steelhead Snorkel Surveys. In 1999, DWR focused on determining where juvenile steelhead rear their young and their relative abundance above and below the Thermalito Afterbay outlet. Additionally, DWR identified the types of habitat that juvenile steelhead prefer and their relative availability within the river. Side (secondary) channels within the Low Flow Channel were identified as high density rearing areas. Research on juvenile steelhead rearing will continue in 2001.

Snorkel surveys are also being conducted to monitor adult steelhead in the river. The goals are to identify migration timing, determine the number of naturally spawning fish in the population, and locate preferred spawning grounds. Preliminary information suggests that there may be two separate runs of steelhead in the Feather River, one in the winter and one in the spring/summer.

Steelhead Habitat Survey. As part of the steelhead and salmon studies, the Geographic Information Center at California State University at Chico mapped the riparian vegetation of the Feather River. The mapping provides a general overview of the status of the riparian forest but does not provide the small-scale data needed to determine what type of cover is available for steelhead. Therefore, the river's microhabitats are being remapped to count the number and describe the quality of riparian habitat available to rear juvenile steelhead.

Beach Seine Surveys. Beach seine surveys will continue to be conducted monthly to determine the temporal and spatial rearing extent of juvenile steelhead and salmon. Survey sites range from Hatchery Ditch to Boyd Pump boat ramp. Beach seine surveys indicate that a small number of salmon (5,000-15,000) remain in the river throughout the summer and probably migrate in the fall. Beach seining also reveals that few steelhead rear their young for any length of time below the Thermalito Afterbay outlet.

Rotary Screw Trap Sampling, Fyke Sampling, Hatchery and In-Channel Coded Wired Tagging.

Rotary screw fish traps will continue to be placed at two locations in the Feather River to monitor the timing and number of chinook salmon emigrants. As part of screw trap sampling, staff will continue to tag naturally produced fall-run chinook salmon with a coded wire tag to compare their return success with that of hatchery releases. As fish return over the next several years, we will analyze these data. DWR tagged approximately 65,000 juvenile salmon in 1998, 135,000 in 1999, and 150,000 in 2000. DWR expects to tag approximately 150,000 to 200,000 juvenile salmon in 2001.

DWR has also investigated the production of juvenile salmon and steelhead from a small side channel called Hatchery Ditch. In the 1999-00 emigration period, DWR trapped approximately 94,000 juvenile fall chinook in Hatchery Ditch. Trapping will continue throughout the 2000-01 emigration period.

Egg Survival Studies and Spawning Aerial Surveys. Aerial photographs of spawning sites and in-channel egg survival studies provide information on the amount of habitat used for spawning and the relative egg survival at different river reaches. Egg survival studies conducted by DWR in 1998 and 1999 revealed that survival is reduced as salmon move upstream. The main cause for the reduction in survival may be egg superimposition caused by the large number of adults crowding into the Low Flow Channel. The number of spawning chinook salmon in most years greatly exceeds the available habitat. For example, 1999-00 emigration data from Hatchery Ditch (a small side channel in LFC) reveal that the actual survival from egg deposition to emergence from the gravel may only be between 5 and 15 percent. Egg superimposition is clearly reducing survival due to the high number of adult spawners in such a small area, since approximately 2,000 female and 1,300 male fall-run chinook died in Hatchery Ditch in 1999, while only 1,000 females actually spawned.

Spawning Escapement Surveys. Past chinook salmon adult escapement (carcass) surveys have been conducted by DFG. Estimates of the spawning run range from a low of 10,000 in 1979 to a high of 86,000 in 1955. The 1969-89 period is somewhat stable compared to pre-Oroville Dam estimates. These estimates ranged from roughly 10,000 salmon in 1953 to 86,000 in 1955. The stability after Oroville Dam is likely due to hatchery influence. Before 1967, all chinook salmon in the Feather River spawned in the river. Estimates for the number of wild chinook spawning in the Feather River since project construction are not available. Escapement estimates of adult chinook salmon since project completion have included both wild and hatchery salmon that spawned in the river. As coded wire tag data are recovered over the next several years, more information will be available on the number of wild chinook salmon spawning in the Feather River. DWR and DFG are working to refine adult chinook salmon escapement estimates.

Redd Dewatering and Juvenile Stranding Surveys. Because the Oroville Dam-Thermalito Complex often varies flows for water operations and Delta requirements, concern exists about the impact of varying water flows on redd dewatering and juvenile stranding. Each October 15, the flows in the lower reach of the Feather River (below Thermalito Afterbay) are reduced, dewatering some redds. Recent studies conducted by DWR demonstrate two very important points: (1) the great majority of fall-run chinook salmon spawn in the low flow section of the river and are therefore not subjected to redd dewatering; and (2) some redd dewatering does occur in the lower reach but is minimal compared to total run size (approximately 0.3-1 percent of the redds are dewatered, depending on the number of spawners in any given year and the timing of spawning).

Additionally, juvenile stranding (in off-channel ponds) can occur during high flow events and even during normal operations. Some stranding, typically associated with higher flow events (>25,000 cfs), has occurred within normal river operations. DWR has substantially increased its effort to evaluate both juvenile stranding, and redd dewatering. DWR will also revisit the ramping criteria - how fast the flows are reduced at the Thermalito Afterbay Outlet - to determine the benefit of adjusting criteria to allow juveniles to move out of potential stranding areas as flows are dropped.

Steelhead Self Creel Surveys. DWR is currently working with several local anglers to gather more detailed information on the life history of Feather River adult steelhead. Data collection includes the size of fish caught, whether the fish are wild or of hatchery origin, general coloration, and whether the fish are kept or released. More data is needed to assess whether there are two runs of steelhead in the Feather River. Angler surveys will continue in 2001.

Invertebrate Research: To learn more about what may be limiting to juvenile steelhead in the lower Feather River, DWR, in cooperation with CSU, Chico, is conducting an invertebrate study. This study has three main goals: (1) to determine differences in the invertebrate populations above and below the Thermalito Afterbay Outlet; (2) to determine differences in invertebrate populations between the main channels and nearby side (secondary) channels; and (3) to determine diet preferences by examining stomach contents of juvenile salmon and steelhead. This work, which started in June 2000, will continue until June 2002.

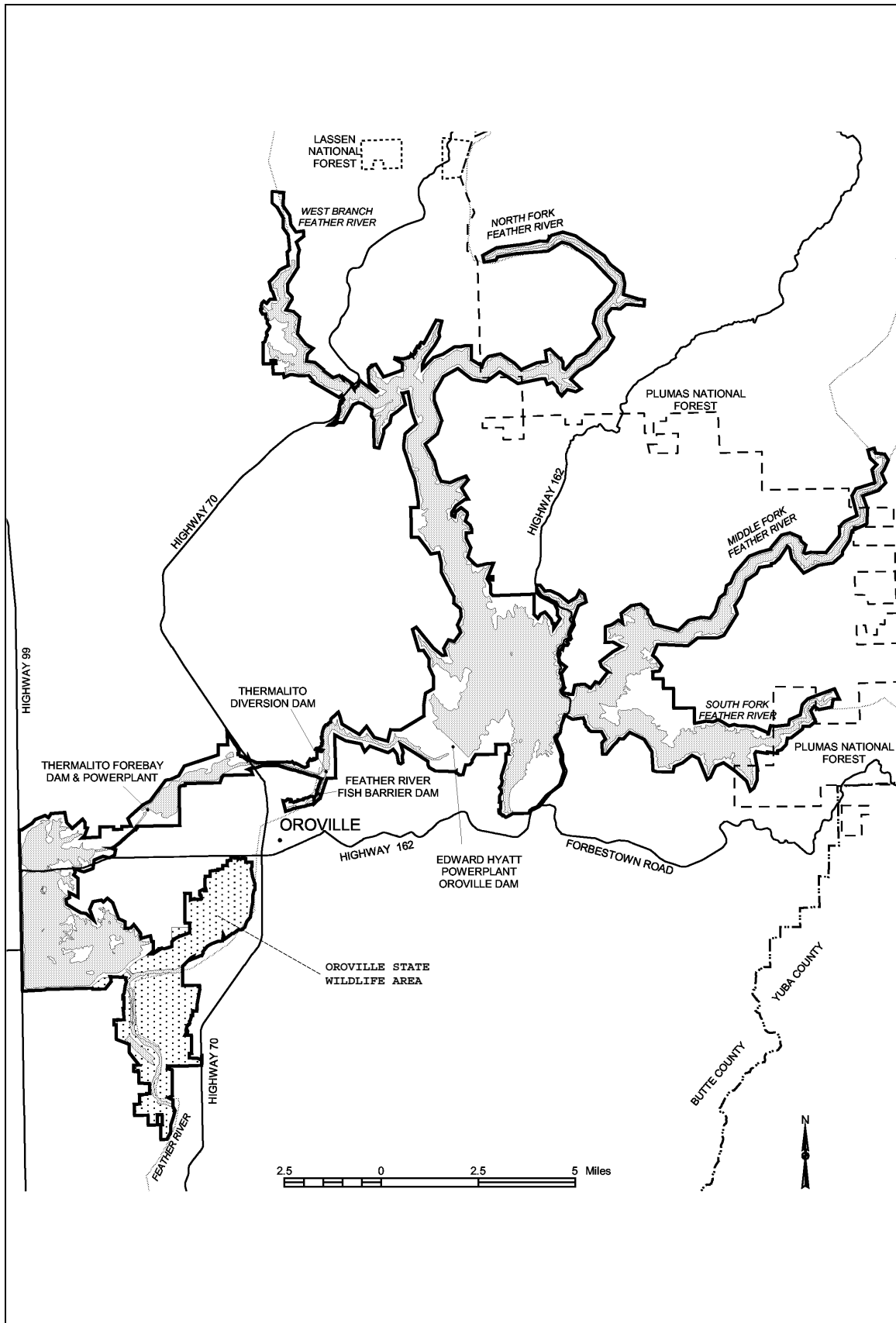


Figure 5

Oroville Facilities Project Area

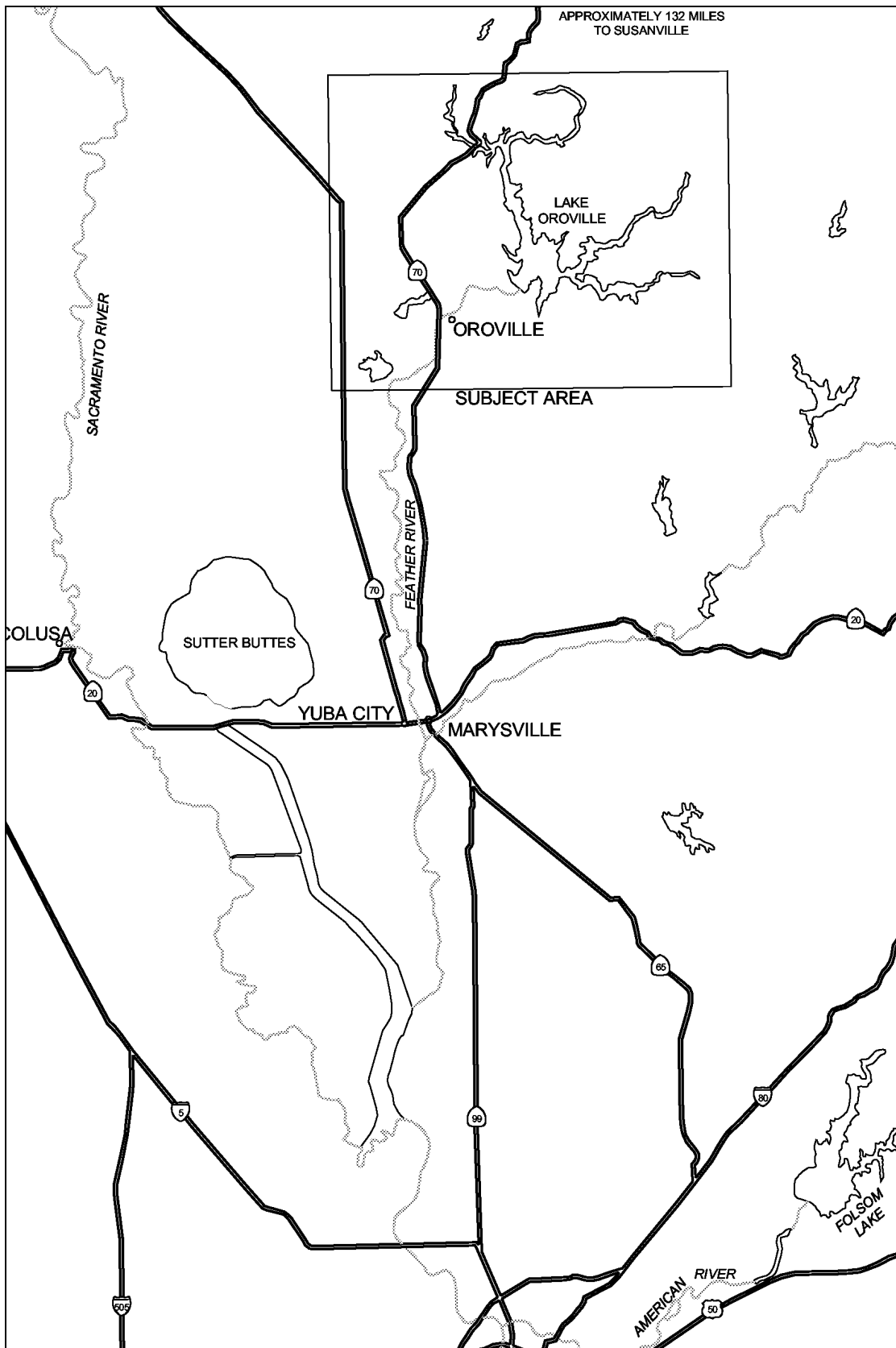


Figure 1

Location of the Oroville Facilities

ISSUE MANAGEMENT

Oroville Facilities Relicensing (FERC Project No. 2100)

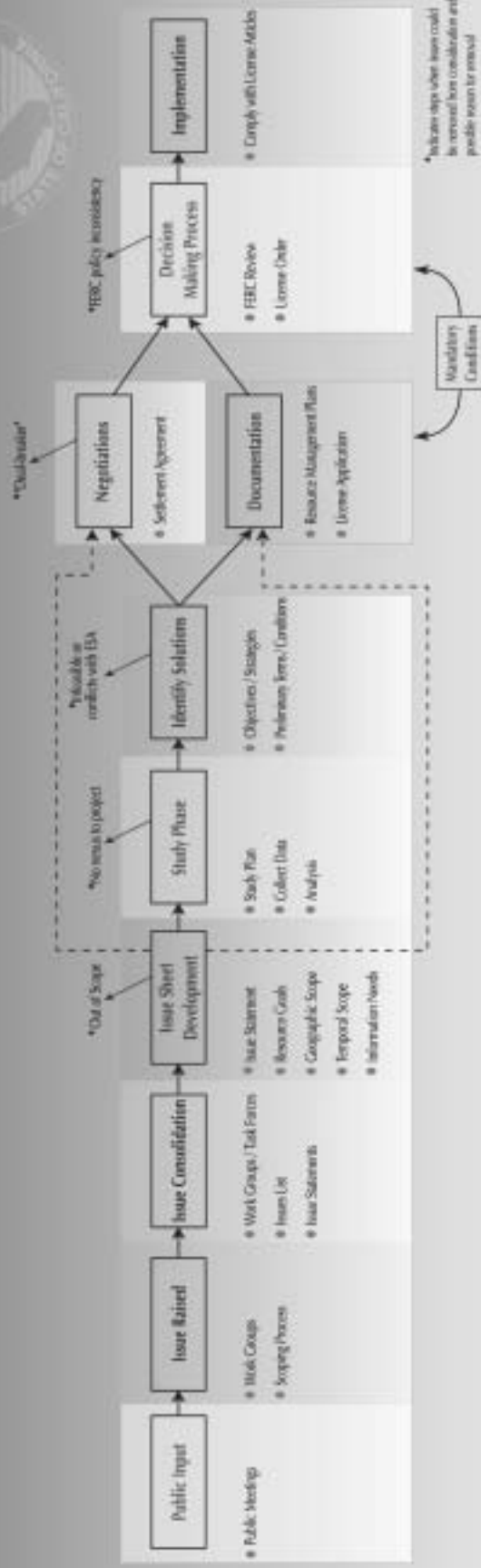


Figure 3 Issue Management Process

Scoping and Study Plan Integration Process

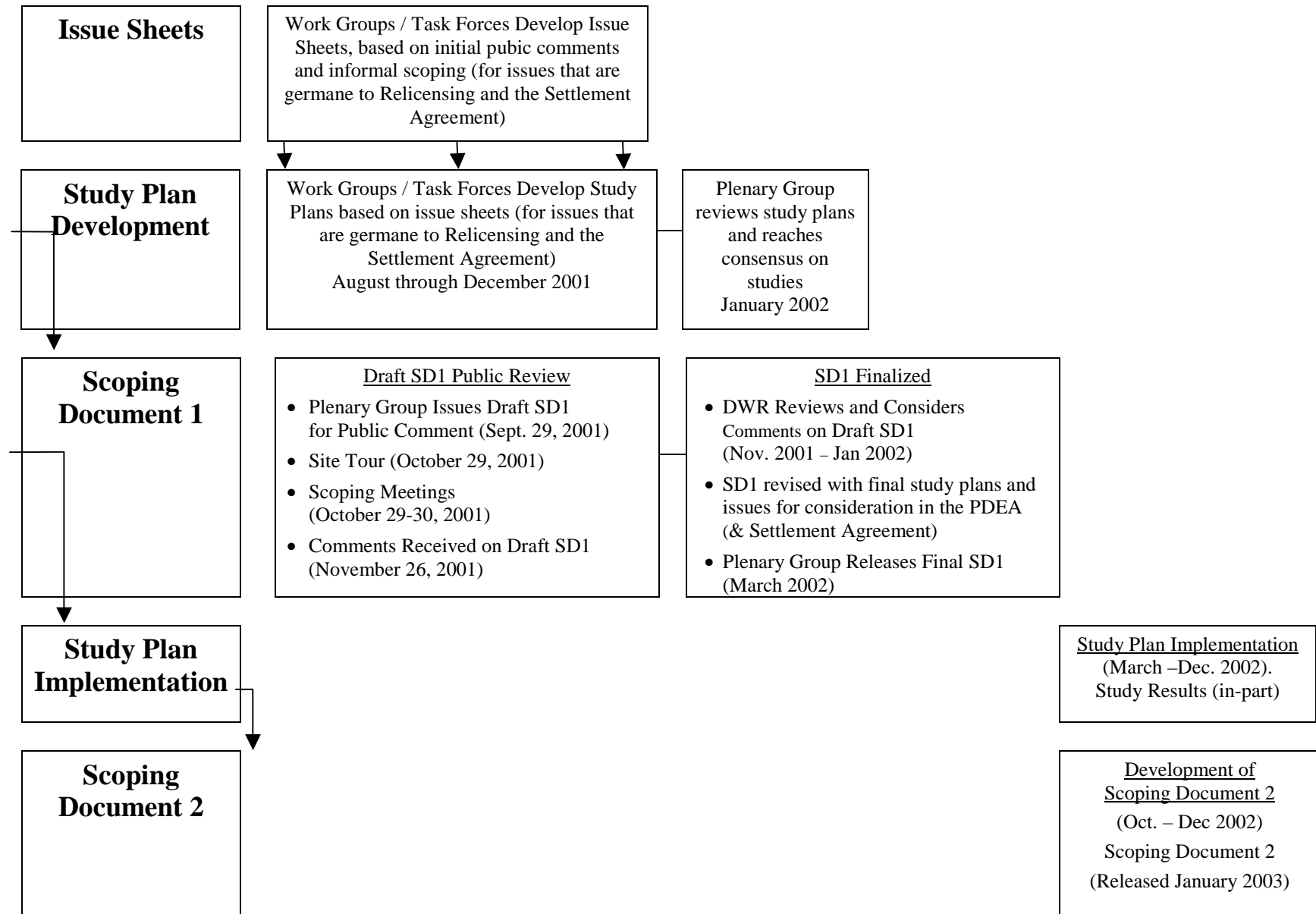


Figure 2

Scoping and Study Plan Integration Process